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THE ABILITIES OF YOUNG CHILDREN. CEC RESEARCH MONOGRAPH SERIES B, NO. B-4.

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DESCRIPTORS- *EXCEPTIONAL CHILD RESEARCH, *GIFTED, *COGNITIVE PROCESSES, *CREATIVITY, CHILDREN, CREATIVITY RESEARCH, SCIENCES, SOCIAL STUDIES, INTERMEDIATE GRADES, ORIGINALITY, CREATIVE WRITING, STUDENT ABILITY, EVALUATION CRITERIA, MUSIC, ART, INTELLIGENCE, TESTS, GUILFORD HOEPFNER MEASURES OF INTELLECTUAL ABILITY,

IN ORDER TO ASSESS THE QUALITY OF CREATIVE PRODUCTS IN ART, MUSIC, WRITING, SOCIAL STUDIES, AND SCIENCE, CHILDREN ATTENDING GRADES 3 TO 6 OF THE UNIVERSITY ELEMENTARY SCHOOL OF THE UNIVERSITY OF CALIFORNIA, LOS ANGELES, WERE DIVIDED INTO TWO GROUPS ON THE BASIS OF INTELLIGENCE. THE HIGHER GROUP (49 PUPILS, IQ OF 130 OR MORE) AND THE LOW GROUP (57 PUPILS, IQ OF 120 OR LESS) WERE SIMILAR IN EDUCATIONAL BACKGROUNDS, EXTERNAL ENVIRONMENT, PARENTAL VALUING OF EDUCATION, PARENTAL LEVEL OF EDUCATION, AND SEX RATIO. THREE INDEPENDENT JUDGMENTS OF EACH CHILD'S PRODUCT IN EACH SUBJECT WERE MADE BY EXPERTS IN THE PARTICULAR FIELD REPRESENTED. CRITERIA FOR CREATIVITY INCLUDED ORIGINALITY AND EFFECTIVENESS OF EXPRESSION. IN FIVE OUT OF THE EIGHT PRODUCTS EVALUATED, A SIGNIFICANT RELATIONSHIP (P = .05) WAS FOUND BETWEEN HIGH IQ AND HIGH QUALITY OF JUDGED PRODUCT. FINDINGS THUS SUPPORTED THE HYPOTHESIS THAT GIFTEDNESS AND CREATIVITY ARE NOT ANTITHETICAL. BOTH GROUPS WERE ALSO GIVEN GUILFORD AND HOEPFNER'S TESTS FOR DIVERGENT THINKING. THE ONLY TEST WHICH SIGNIFICANTLY SEPARATED THE HIGH FROM THE LOW GROUPS WAS THE ASSOCIATION TEST (T TEST, P = .05). SINCE NO SIGNIFICANT DIFFERENCES WERE FOUND BETWEEN HIGH AND LOW IQ GROUPS ON THE FOUR REMAINING TESTS, A NEGLIGIBLE RELATIONSHIP BETWEEN INTELLIGENCE AND DIVERGENT THINKING WAS INDICATED. EXAMPLES OF THE CHILDREN'S PRODUCTS IN ALL AREAS AND AN 18-ITEM REFERENCE LIST ARE INCLUDED. THE APPENDIX CONTAINS BIOGRAPHICAL SKETCHES OF THE JUDGES. THIS DOCUMENT IS AVAILABLE FROM THE COUNCIL FOR EXCEPTIONAL CHILDREN, NEA, 1201 SIXTEENTH STREET, N.W., WASHINGTON, D.C. 20036, FOR $2.00. (JP)

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by Ruth A. Martinson and May V. Seagoe

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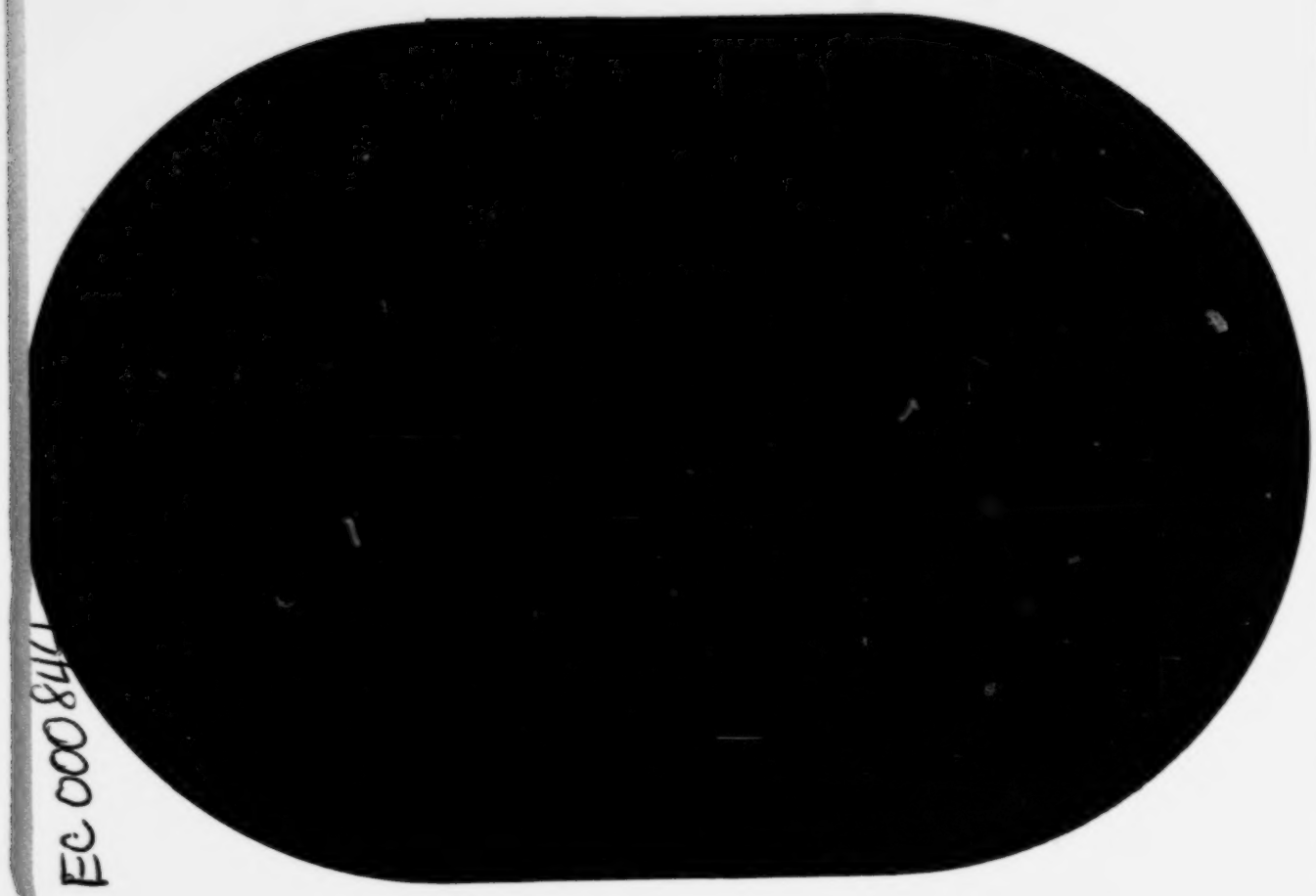

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The Abilities of Young Children

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Foreword

For some years educators and psychologists have been actively interested in the dimensions of creativity. Numerous studies have been devoted to the qualities of the creative individual, the workings of the creative mind, and the climate which encourages the creative act. Most of the studies have been conducted at the adult level, and have dealt with either the process of creativity or the personality characteristics of the creative individual. Some persons have written of the need to eventually get into the quality of the product in those dimensions which experts agree are the dimensions of creativity. No one yet has attempted this with a wide range of children's products.

The present monograph describes assessment of children's products from a wide variety of topics in art, music, writing, social studies, and science. Ratings by experts of the quality in children's products are compared for two groups who differ in measured intelligence. The procedures described may well provide ideas for other more elaborate explorations of this approach.

Acknowledgments

The collection and interpretation of the information reported here would not have been possible without the cooperation of many people. We thank especially the persons listed here for their contributions which provided the content for the study.

For collection of children's products, the staff of the University Elementary School: Madeline Hunter, Principal; Mee Lee Ling, Olga Richard, Sonia Riha, George Thayer, Barbara Fisher, Emma Griffith, Frances Klein, and Robert McClure.

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1
Problems in Measuring Creativity

For some time we have been concerned with the implied dichotomy between mental giftedness and creativity. The writings of some scholars have presented the idea that the qualities are somewhat independent and unrelated, and have even implied in recent years that some low ability persons are the most creative.

These assertions have been based upon findings from tests designed to measure components of creativity. The fact that the results of these tests and those of intelligence tests differ is not to be disputed. It is generally assumed that the creativity tests measure components of ability which are not tapped by intelligence tests.

Whether the creativity tests actually measure creativity is yet to be ascertained. Longitudinal studies of much wider scope than any yet conducted will be necessary to determine whether persons labeled creative by tests actually bear out the promise of the label.

Initial enthusiasm about creativity measures has been replaced during the last three years by some reserve and caution. Persons have begun to question whether the tests, or other means now being explored, measure creativity, or indeed, whether we know what the term creativity means (Thorndike, 1963). Whether claims can be made that relatively independent factors in any combination actually measure a general factor known as creativity is at present subject to further study and proof.

Questions of whether intelligence and creativity are independent arise when one reviews the *Genetic Studies of Genius,* Volumes 2 and 4 (Stanford University, 1926, 1947), where intelligence and creativity are neither separated in the retrospective studies of men of genius and their abilities, nor in the accounts of the unusually high inventiveness and productivity of the gifted population as adults. The accounts of the parents in the Terman studies of the numerous talents present in their offspring, and the observations of the research staff of the California Study of Programs for Gifted Pupils (California State Department of Public Instruction, 1961) tend to support the assumption that an intellectually gifted population is one of versatile talents and high creative power.

Speculation may go on endlessly as to whether the gifted of Terman's study maintained skill in the arts as avocational rather than vocational, despite the early promise of virtuosity that some displayed, because of cultural pressures which rewarded their high success in writing, science, and the professions in general, instead of supporting and encouraging their creative, aesthetic works. Speculation could also persist on whether the sometimes assumed inverse relationship between the highest measured intelligence and creativity is not due to the increased pressure on the most highly gifted child in the schools to conform to the pattern of the mean, and thus increasingly to subordinate his interests and abilities in favor of acceptance by others.

These questions are difficult. The measurement of creativity is difficult. Searches for information on the complex subject of creativity have been directed toward studies of the creative person, the creative process, the creative product, and the creative environment or the facilitating milieu through which creativity emerges. The present state of knowledge seemingly consists of a catalog of terms descriptive of persons judged creative by their attainments, general agreement that study of the creative process is still in progress, and numerous statements about the creativity producing environment which are reminiscent of books dealing with mental health in the schools and effective methodology.

The Creative Person

Most of the characterizations of the creative person are based on studies of adults nominated as creative in a given field of endeavor. The selections generally are made by experts who name persons in their own fields as creative on the basis of production. The agreement of experts is by no means unanimous (MacKinnon, 1961) nor has the study of creative adults yet been inclusive enough to permit final assertions. Certain traits are mentioned repeatedly, however, in the writings of research workers.

Barron (1963) describes the creative person as one who can comfortably allow regression, and who is basically confident in his ability to discern reality accurately. He perceives the creative person as unusually sensitive and open to experience. Unusual psychological complexity is cited as a quality of the creative individual in numerous writings, Barron's among them.

The creative individual is variously described as self assertive, uninhibited, less conventional, self disciplining, independent, widely informed, constructively critical, versatile, enthusiastic, dominant, highly energetic, and as one who enjoys work and production.

Taylor summarizes thus:

> It has been suggested that the creative person is curious, enterprising in his ideas, intellectually persistent, tolerant of ambiguity; he shows initiative in his area of work; he likes to think and to manipulate ideas; he has an inner need for recognition; he needs variety and autonomy; he has an aesthetic and to some extent religious orientation; he resists premature closure and crystallization of concepts, though he has a strong need for ultimate closure; he desires mastery of a problem; he finds challenging the intellectual ordering of the apparently unclassifiable; and he wants to improve upon currently accepted orders and systems. The use of passional sources of energy and kinesthetic cues may be important. High energy with vast work output through disciplined work habits is usually found (1964, p. 24).

It is interesting to note that many of the traits listed by Taylor are found also in earlier catalogs of traits descriptive of the intellectually gifted person. The California Study lists these learning characteristics of gifted children:

> Facility in expression; questioning attitude, intellectual curiosity, inquisitive mind; power of critical thinking; skepticism, evaluative testing; creativeness and inventiveness; intense attention; persistent, goal-directed behavior; sensitivity, intuitiveness; high energy, alertness, eagerness; periods of intense voluntary effort preceding invention; independence in work and study; versatility and virtuosity.
>
> Sense of the significant; willingness to examine the unusual; interest in inductive learning; pleasure in intellectual activity; ability to see relationships; liking for structure and order (California State Department of Public Instruction, 1961, p. 172).

There are many points of agreement between the two descriptions, although the point of departure presumably was different.

Knowledge of traits identified and agreed upon in creative adults is useful to persons working with young children. The teacher who is aware of the desirable aspects of divergence may become more tolerant of such traits and behaviors through her knowledge.

Prediction of future creativity on the basis of traits perceived in children is hazardous at this time, however. The research which has been done on the personality of the creative, or productive, or original individual has been done at the adult level largely through clinical studies and tests which contain adult vocabulary, and adult problems and concepts. Generalization would be premature on the basis of existing knowledge, and would presume a certain stabilization or permanence of childhood personality traits.

The hazards of judging a person as creative at any age are aptly described by Taylor:

> For to assume that *creativity*—or *success, salesmanship,* or *leadership*—is unitary may be to overestimate the possibilities for coordination of thinking at our present state of knowledge. "Creativity," a controversial and nebulous word, has different meanings to different people, and the existence of multiple criteria should be recognized (1964, p. 156).

The Creative Process

Most of the studies aimed at assessment of creativity as a process have been based upon the work of Guilford. Assumptions are made about creativity from the success or failure of subjects who perform on the various trait measures which he has developed. According to Taylor (1964), these tests, which describe or measure creative ability, have met with some success. The validity of these tests as tests of creativity still requires added study, since tests, ratings by others, and other means have produced varying results. These variations may be due to the practice in some studies of using tests with highly specialized and highly selected adult groups, among whom great differences might be expected.

Part of the difficulty in utilizing process measures lies in variations of definition, lack of agreement on criteria, and diversity of means for assessment. A large part of the problem relates to prediction, that is, whether process predicts product. In the final analysis, this question can be solved only through longitudinal studies.

Creativity Products

In order that products be deemed creative, they must contain certain qualities which make them more than usually valuable in relation to those of the total population from which they come. The products should possess some elements of uniqueness or value or worth which would make it possible for those who are judging them to rate them on the basis of defined criteria.

Investigations of creativity have dealt with product less frequently than with person or process. Yet product lies at the heart of creativity, for unless product evaluation is possible at some stage, the assertions regarding the individual, the process, or the environment remain suppositions rather than fact. If the tests which supposedly denote the creative person are valid, or if the process of creativity can be identified, then products which are creative should at some time result. These presumably would be products which meet the generally accepted creativity criteria of being novel, of having some intrinsic worth, and of possessing some value beyond the ordinary.

Assessment of creativity products again is fraught with difficulties. Products can be material or they can be abstract, in the form of ideas. Who is to say when creative products will be forthcoming? Over how long a time span ought one to assess products, in order to gain a measure of creativity? Who is competent to judge creativity, or the inherent qualities of creativity as described by experts? How do we sample effectively the legitimate scope of creativity? These are just a few of the problems.

The Problem of Criteria

The need for clear criteria is apparent in all of the preceding statements on person, process, and product. The very meaning of the term creativity also is extended into other contexts. Macleod (1962) observes, for example, that Max Wertheimer's book, *Productive Thinking*, could just as well have been entitled *Creative Thinking*. Wertheimer describes the difference between productive and unproductive thinking as between clean and ugly thinking, or between the kind of thinking that is repetitious and the kind that goes to the inner relationships of a problem. Taylor differs in part when he distinguishes creativity from productivity as being high quality of a particular kind as opposed to quantity. They could well seem to end with the same criterion.

Probably the best current referent for the person who has the temerity to investigate any aspect of the subject is the statement of Stein:

> . . . there does not appear to be any single "ideal" or "absolute" criterion of creativity that is presently available for all researchers. Efforts are in process to develop ultimate criteria and attention needs to be paid to process characteristics. While these efforts continue it seems feasible that investigators can do no more than select some reasonable criterion for their research (Stein, 1962, p. 17).

Resolution of the Dilemma

The resolution of the problems indicated in the previous sections may resemble equivocation. Caution seems to be the one necessary ingredient in reporting studies even remotely related to the nebulous field called creativity at the present time, however.

After due consideration of difficulties, the decision was made in the present study to submit products to evaluation by experts in a wide variety of areas from which creative products traditionally emanate. The evaluated products are only samples from each field, as tests are only samples of performance. It was felt, however, that the evaluation

of products by experts would lead, at the very least, to some interesting cues and speculations.

Perhaps the products thus judged in the current study can be labeled creativity products. The case for such a label can be made on the grounds that the responses were required on topics and in situations calling for originality and effectiveness of response in both idea oriented and aesthetics oriented tasks. By the time the creativity of a child is evaluated by fifteen independent experts in art, in social studies problem solution, in creative writing, in creative rhythms, and in science problem solution, some assumptions about his creativity may be made. The experts, in making more than two thousand independent judgments of the relative originality or effectiveness of expression in the work of a group of elementary school children, provide sound bases for generalizations about quality of performance. It seems further that legitimate comparisons of this type of evidence, evidence derived from creativity tests, and individual intelligence tests on the same population can be made.

The assumption made in the contents which follow is that the abilities of children as measured by the individual Binet intelligence test are positively correlated with creativity measures as devised by Guilford, and with creativity performance through products independently judged by experts.

An earlier attempt to evaluate relationships between mental ability and products was made in conjunction with the California Study of Programs for Gifted Pupils. This ended in failure when it became apparent that the teachers who were asked to select products had widely discrepant notions about creative performance. It was further apparent that the selection of products would have to be governed in some way so that comparison would be possible.

The opportunity to study the relationships of ability, performance on creativity tests, and selected products was afforded by the staff of the University Elementary School, University of California at Los Angeles. The accounts and examples of children's work on the following pages were collected during the spring semester of 1964.

Criteria for Judgment

The decision was made to assess products insofar as possible on two criteria which appear uniformly in the literature as descriptions of those productions which have been called valuable or unique or creative. The criteria used were originality and effectiveness of expression. Originality was defined further as follows: originality; novelty; uniqueness in ideas or expression; variety and fluency in output (on qualita-

tive not quantitative basis). Effectiveness of expression in aesthetic products was defined as aesthetic quality: poetic, exquisite quality of communication: impression or feeling of beauty: effective use of elements and/or media. On products involving effectiveness of expression in ideas the term was further defined as appropriateness of solution or logic.

The judgments of products were made by persons who had attained some eminence for their success in the specified product area with elementary school children. Independent judgments were made by three experts on each product in the various fields for each child. These ratings were combined to provide a mean rating for each product. The mean ratings by the three judges then were combined for a final mean rating on a given product. The combined judgments of three experts were based upon a rating scale with the components described above.

2
The Population and Educational Environment

One of the factors to be considered in assessing the performance of children is environmental influence. If children attend different schools, or come from widely differing socioeconomic backgrounds, the influence of these differences is a possible reason for varying performance. Obviously, the elimination of environmental influence is impossible. Environments for children within the same family differ because of perceptions by the children themselves. Nevertheless, when the external advantages are similar and the educational background is the same, environmental factors become less important as an explanation for differences in performance than is the case in widely disparate populations.

The children at the University Elementary School come from families which are mainly in the middle and upper middle socioeconomic classes. None of the children comes from the lower class. The minority group status of a few is irrelevant. Regardless of wealth, color, or other externals, education ranks high in the family value. The children in the school were chosen from a continuing applicant list of several thousand, and in most cases, the request for admission was made shortly after birth of the children. The educational level of the parents is relatively high, and admission is sought because of the advantages offered by the school.

A certain proportion of the parents are affiliated with the university as faculty, graduate students, or employees. The other parents live within the commuting area, and are mainly in business and professional occupations.

In most instances the children have attended only the University Elementary School. Some have been away for leaves of absence, but most have been in continuous residence since nursery school or kindergarten. Because of the relative stability of staff, they have had many of the same teachers. All of them have had the same teachers in special areas such as art, music, science, and mathematics.

The Pupils

The population in the study came from the older groups at the school. The five ungraded classes which they attended represent the chronological ages normally found in grades three through six.

The classes chosen were limited to those which included children who had developed written communications skills. This was done so that no child would be penalized by lack of ability to write on the designated topics. The classroom teachers recommended assistance for several children, and in these cases, tape recorded interviews were substituted.

The participating population included all those children on whom complete 1960 revision Binet intelligence tests were available. On the basis of intelligence test results, the population was divided into two groups. The high group (H) included all those children whose Binet IQ's were 130 or more. The low group (L) included those with Binet IQ's of 120 or less. The group ranging from 120 to 129 was omitted from the study to permit the study of two populations clearly differentiated in ability. The mean IQ of the high group was 142.7, and the mean IQ of the low group, 107.5. The range of the high group was 130-170, and the range of the low, 86-119. The high group included 49 pupils, and the low, 57. Because of class distributions, the number of boys and girls in each group was approximately equal.

The children were not classified in any way for the judges. The only information available at any time to the judges was the name of the child. Since all of the judges were unacquainted with the children, and had no contact with the staff during the time of the study, no bias through prior knowledge was possible.

The School

The educational philosophy of the University Elementary School is directed toward practices which theoretically should develop creativity in children. The faculty provides wide experiences and relative freedom for exploration and expression by the children. The teachers are selected from among the best available, and as a group generally are considered to be of superior caliber.

Through comparatively small classes and the use of carefully planned teaching, efforts are made to conduct an excellent program. The children are given contacts with expert teachers in specialized fields, and with student teachers who have been assigned to the school because of their high qualifications.

The school provides outdoor work areas, spacious classroom facilities, the best available modern equipment, a special community room

for multiple purposes including rhythms, a special art room, a science laboratory, a well stocked library, a projection room, and other areas. No effort is spared to provide a learning facility which will encourage creative production by the children.

3
Products

The initial products, which were later discarded, included some subjects such as mathematics and a letter of introduction for a visitor to Earth from Venus. They were not submitted to the judges because of certain limitations. The mathematics samples led to restricted answers rather than to a variety of responses. The introductory letter for the visitor from Venus, conceived as a science task, seemed to be productive as an example of creative writing, but quite apparently was influenced by science fiction as portrayed on television.

The final products used in science came from proposed solutions of two yet unresolved problems related to travel and communication on the moon. A poem and a written story were judged as creative writing samples. In social studies, the children gave their responses in the solution to two differing problems within the social studies realm. In art, judgments were based upon paintings and clay models; in music, filmed interpretive rhythms by the children were evaluated.

All of the samples were planned to meet the following criteria:

1. The task had to contain some intrinsic appeal and interest to the children.
2. The task, if a problem, had to be at least theoretically possible of solution, rather than purely fanciful or whimsical. (It is felt that some reported creativity tasks might produce little response and even resistance from highly logical and highly intelligent children.)
3. The task had to be open to a wide variety of responses or solutions.
4. The performance of the task had to be potentially satisfying to the children.
5. The task had to be appropriately within the developmental level of elementary school children.

Science

In order to encourage communication which was as free and spontaneous as possible, the children's responses to the science questions were tape recorded. The interviews were conducted by two trained assistants, and the interview process was carefully rehearsed to insure, inso-

far as possible, rapport and ready response. The taped interviews were then transcribed to cards to permit ease of evaluation and distribution of rating.

The responses of the children obviously are only samples of one kind of science performance. If one were to assess so called creativity or originality in science, it would be necessary to sample widely not only responses to science problems such as those presented but also the performance of children on open ended science experiments and on widely different structured experiments.

The science products are ideas. The ideas are solutions to problems which were unsolved and being studied by adult scientists at the time of this study. The problems were chosen to the exclusion of others less difficult to eliminate the possibility of contamination by previous knowledge. It was assumed that children on the whole are less hesitant to tackle difficult problems than adults. This assumption proved to be correct.

Science problem areas which were presented to the children included the moon problems, the previously mentioned letter of introduction by a being from Venus, and these two questions:

During the last fifty years, man has invented the jet plane, rockets, the radio, television, and many automatic machines for factories and business. What do you think will be some new inventions during the next fifty years?

As you know, the building of homes changes all of the time. Can you think of some new ways of building homes that no one has thought of yet?

The responses to these questions were interesting, as the following examples indicate. The examples also make evident the influence of the children's experiences and their contacts with various media.

Inventions

Well, one I'm certain will be is the telephone, the TV set telephone where you'll be able to see the person you're talking to. Also wrist watch telephones. Besides that I suppose they'd be changing the electric lights to as soon as you open the door, they'd be no need for the lights or anything. The light would be really going on as soon as you open the door, that will be good, and probably automobiles will not have gas and may not even use control levers—probably true of warfare equipment. I'll probably be in, you know, the rockets, in different places they'll probably have something that will work in places with no air and different.

Well, I think they'll improve on these things and I think when they, if they ever get to the moon, they'll be many other inventions—many inventions like we have on Earth today like something we can put on Earth today you'd need another way of putting them up on the moon—inventions like that. And

there'll be inventions of such as maybe just about in every field I guess. There'll just be new inventions. I'm almost positive that in the next few years they'll be using this kind of glass that you can see just—inside there's a window and on the other side there is a mirror and that's handy in homes for burglary, and police force there are many inventions where . . . I think just push a button and they have fifteen different cars in the area. Now they have to call on the radio and that takes a few minutes. I just can't tell all the inventions they're coming with. There are millions and millions. There are so many each day that we don't even know about. Better ways of communication, I know the telephone company is developing something that you could just take the numbers that you frequently call and they're written out with holes and just stick them in something and automatic dial will dial it for you. Just things like that. And of course, there will be not only inventions but discoveries like in medical —I think that they will discover a cure for cancer in the fifty years. Better cure for TB. Rheumatism, any other diseases.

Well, in the magazine the other day I read that this guy, he invented a robot that could put things away and clean up the house, iron and wash and everything and he was going to sell him for $150.00 it said there, you know, but anyhow he couldn't get any business and they broke down awful fast and you have to have them installed and cost about $3000.00 to have them installed so that didn't work out but it seems like they have them in the future that would work out. And things like in the Jetsons and stuff—we might some day live in space on the moon and in Mars.

Complex computors, better than they are now. Different ways for communication like you could see the person you're talking to on the telephone. Could make telephone calls to practically every place in the world.

New Ways of Building Homes

Well, I don't know if anybody's thought of it but you could have homes that had different layers and indents for parking cars and use them as playgrounds and stuff for the kids. And you could have buildings that were shaped like rockets that went up and they might have little terraces out that you could look out or something and have an attic up in the tip of the rocket and they could be built out of all metal so they'd be real strong and they'd resist fires. You could make houses that were all squares that had square roofs and but they would let the water run off by being square like this sort of like diamonds, oh well. You could have them in funny shapes that would be impractical so that the rain would run off the fire wouldn't catch to it and different things like that. And you could have houses up on stilts so that burglars couldn't bother you and it would have sort of like a drawbridge on each stairs that were down that came up, you could do that at night. You could have sort of a doorbell. You could have houses that were up real high on stilts like and you could have cars that went down on this ramp or something so you wouldn't have to run down a ramp or go down a flight of stairs or something. Or you could have buildings that were lots bigger, you know, have lots of rooms.

Yes, if they could have them in the air, or you could have one built with stained glass windows or something. You could have one built in Antarctica and the North Pole and the South Pole. You could have one built out of ice. You could have it so the ice won't melt under heat and have a heating system in it. And you could have some underground houses. And you could have those little, that you could walk up or something. An elevator you could go down in it. Is this in the future? You could have a little log, you could have a belt with you, with a little button and you could push it and it would just expand into a great big house. And you could have a great big house expand into a little house. You could put it in your pocket. Or you could have a house folded up like a piece of paper and then you take and you make a switch or something and it would come up . . . and then you would just collapse it and you could have a house with no roof and when it's raining you could have a little sliding glass roof that wouldn't break, that is unbreakable. I guess that's it.

Well, I'd make it real modern, everything would be push button, would be half lath, flat roof so it would open up, I want to have sunlight and the beds when you made them you push a button and they go into the wall, and have the kitchen real modern, everything push button, the sink, when you push a button the water comes out. I'd have my house made out of metal I think or atomic age stuff. I'd have chairs real modern, push a button and they'd rock you and push a button go back and forth and stuff like that. Push another button and you can move anywhere around the house on the chair. When you push a button . . . I'd have a little lake around the house maybe and real wooded. And I might have real modern swimming pool. Glass that when you push a button it opens up instead of opening it up. New stove, if you want to cook a roast or something, well it usually takes around three hours, you could do it in five minutes, or something. You could as I said before you could have a big machine on the wall and you'd type out little cards that say what you want and you stick it in the computer and it will give you what you want or make it in around five seconds and cook it and everything and it will give what you want and I'd have a microphone all through the house and a belt when you want to go around the house you just get on it and I'd have a, maybe, three story house and a tube instead of stairs you get in this tube like an elevator and go down to whatever floor you want to go down to. And have a machine when you want some new clothes you press a button and it will make the clothes for you. You can take a shower without even getting wet, but you'd be clean.

Have a thing that you could have a prefabricated house, made of all steel. You could have a house already made that you could put on a lot. You could have furniture already built in a house. If you have a machine you could build it without hammers, have machines to paint it and to fix up. Have machines that could build it faster, have a house built with all different kinds of wood, by certain machines. You could build a house without a chimney that the fire just goes out goes out through the ceiling and smoke, that's all.

Even more interesting were the communiques from Venus. Quite apparently, this experience was enjoyable to the children. Their ef-

forts met the criteria of potentially wide variety of response, and of satisfaction to elementary school children, but seemed to be too fanciful to permit qualitative judgments. The possibilities for evaluation appeared to lie in the realm of expressive writing rather than in science oriented productions. The humor and imagination made the products delightful to read, but unsatisfactory for the established science criteria.

Dear Leaders, Creatures, and All Life of the Planet Earth,

There is no reason for you to be alarmed. I understand how you feel.

I am a man from Venus. I have come here to inform you of a new way of living and keeping peace.

There is no doubt, I hope, that you understand that the minds of our people are superior. Do not attempt to destroy me merely because you can't. Any of your equipment is harmless to me.

I know much of how you live and keep peace. We know many things about you. We think some of you Earth people are running into defeat. We on Venus have devised a way to keep peace and freedom. This cannot fail. We have many secrets which we will tell you. I have to leave from this point. I shall return in twenty-six of your hours.

Sincerely,
cE%$&

Dear Earthling,

I am a Venusian, no not a Martian, not a moon man, a Venusian.

I am on a peaceful mission with our governments.

My name is Malaph Rantazor. I will give you information about the life on our planet. I breathe hydrolic nitrox boxinitis known to you as H2 01 G8.

I hope that you will accept me in some of your social circles. I am a Christian. You may wonder how I got to be one but that is a long story.

Sincerely,
Malaph Rantazor
alias

Dear Earth People,

My name is Peter the Ic, King of all Venus people in the suburb of Calienta.

My height is $6 \times 8^{6}\text{-}5^{10}\text{-}6\text{-}28^{2} \times 6$. My waist is 3×6.

I have come to discuss the problem of space. You have been sending up some very crude things called satellites. They have been hitting us without warning, so could you please send us warning when they are going to hit, so we can shoot them with our disintegrating guns. Would you like some help in space travel, since you have been sending up such crude satellites. We Venus people have conquered all the planets, so do not do not try to conquer them.

I am six centuries old.

I want to make peace and unite our countries.

Peter the IC

P. S. We have been getting complaints from the Moon people about satellites hitting them. Please stop shooting the satellites up into space.

The judgments of science products, then, were based upon the children's responses to science questions on unsolved problems. Past experience probably still was a factor, but the solutions had to be those of the child.

The judges evaluated the work of the children in their own groups, so that the children were compared to their own age peers, and were not penalized by age factors. The children's names appeared on rating sheets (Figure 1). Nothing was known by the judges about the children, their background, measured ability, interests, or any other factors. Judges had no communication with school staff or each other.

Figure 1. Rating Scale Used by Judges of Children's Products in Science.

Rater_____

Rating Scale—Science

Directions: Judge each child's product from 9 (highest in group) to 1 (lowest) on each criterion. The distribution from high to low should be approximately even for each criterion. Judgments should be made on the basis of total group performance within each age category. Write in a number (9) for each of the criteria beside the name of each child. Add: Mark X before name of any child judged to have irrelevant but potentially valuable ideas.

Name of Child	*Originality Dimension* Include here originality; novelty; uniqueness in idea (s) or expression; variety and fluency in output (on qualitative not quantitative basis).	*Effectiveness of Expression Dimension* Include here appropriateness of solution, logic.	*Mean*

The interviews presented the problems to the children in uniform fashion. The statement was made, "I wanted to talk with you and tape record your answers to some questions to see how you think about some

problems. You'll find that they are fun. I'm going to ask other children these same questions, so will you please not talk with anyone about them. Promise?" Situation 1: (Presented verbatim)

It is the morning of March 1, 1979. You are one of the five crew members of the space ship Comet Four. Next week you will be departing for the moon. Before your departure you and the other crew members want to solve two problems. One of these is how to communicate on the moon. Sound travels through some substance, as a solid, such as wood or metal, or through gas, such as air. But we know that none of these things are on the moon. What can we do?

Response, as expected, varied in quantity and quality from child to child. The interviewers made every effort to encourage communication through asking if there was anything else or if there was more that the child wanted to add. No attempts were made to force communication or to cause the child to feel uncomfortable.

The following responses are typical of those rated low. The children either were unable to offer any suggestion, or could not go beyond the suggestion that the persons remain very close to the others.

You could get real close to each other and then sort of talk in the other guy's ear. I'm not sure that would work though. And you could have hand signals that would mean different things to the other people that you were talking to. I'm not sure that would work either. That's about all I can think of.

Sign language. Or . . . I can't think of anything more. I can't think of anything.

Responses which were rated high by the judges from children within the same age group as those above were so judged because of the quality and originality of ideas. Mere verbosity as such did not merit high rating, unless the higher quality of output was also present.

Well, you could have a little transmitter on your throat, here, so it could pick up the vibrations from your throat and the sound waves would travel by remote control to the other man. You would have hearing devices. You could put your helmets together and talk, and the vibration would go through the helmet. That way if one of you got lost you couldn't put your helmets together and talk. I guess, there could be a very powerful radio that could travel through a place with no air but that would be the hardest of all, I guess.

Well, for one you could contact with radio because they do not need airwaves, because we have it up in space with Project-Mercury, and we've been contacting back and forth by radio because they do not need radio, and also you could just touch like this, and since you have something the sound should go through when you touch each other's hand. I can think of some weird ideas like sign language maybe. Or maybe you could take a tapper or something

and put it against the guy's ear and you tap, if you know international Morse-code or anything like that, you've got it. Counteract the tapping and sign language because of the bulky space suits, and in space sometimes you have to jump up and down, and if you jump up and down on the moon, unless you have some pretty heavy shoes, you're gonna go up and it's gonna be a long time before you go down; like would you like to be orbiting around the moon for umpty billion years? And you don't even know how long the universe is going to last. Well, I think, if the whole universe is destroyed, which is impossible, that we'll just start all over again, and we can think up something crazy, crazy to us at least, that might be a good idea for communication. Or by then talking will be out of the question. We'll just communicate by mental telepathy. And if you ever watch "My Favorite Martian," you'll find out that in a hundred and fifty billion years we'll be able to read minds, that is unless we don't destroy ourselves with an atomic war and I'm changing the subject but . . .

Although the television influence is apparent in the last statement in the second example, much independent content is also present. The difference between these which were high in rating and the first two examples is quite apparent.

The second situation was presented to the children by the interviewer in the same interview:

The second problem comes about because we need to figure out how to keep from getting lost on the moon. If the moon is made of rock there aren't any trees to mark, and there's no water, so we wouldn't have any streams to follow. And, of course, there are no streets or highways, or any other kind of markers. We have thought we might use a compass, but the moon has no magnetic field, so a compass won't work. Now—how would we keep from getting lost on the moon?

Again the responses of children rated low on the question were so judged because of limited response, irrelevance, or lack of suggestion. These are typical:

Pile rocks in one rock pile. Pile up rocks in different places.

Well, if you're going on a rocketship maybe you could go back to the rocketship when you get lost. Of course the moon is bare so there would be no things in the way so you could see the rocket ship and go towards the rocketship. There's no way to talk, is there, that's the problem. You could call them through sound waves if there was air on the moon. That's about all I can think of.

The responses rated high had some logical solution, sometimes in the form of a single response of merit, sometimes in the form of several

suggestions. The contrasts are drawn among children from the same age group as those rated low.

Well, what would I do is I would make a rule that no spaceman is allowed to go out of the range of his suit-radio, so he can always get back by counting on messages sent by the spaceship. Well, that's about all.

Cables! Tie a cable around one of you. You could have a long cable and you could tug on it when you are lost and the guy would follow you and you would have a big reel for the cable and let it out and guide it for in a crevice or something. And you could use communication, that little radio I was telling you about. You could use that for communicating. That might not work if you were in a big cavern. But a cable inside, that's the best. You could have a meeting place, like you would have it marked with infrared, so it would light when it's dark, it glows and you would have magnetic rays and you would have a compass, magnetic rays on the spaceship, ultraviolet light, and you would have a little compass attached to your thing there and you look and it points towards the ship. And then have motors on the backs to get to the spaceship or else if they wanted to jump the way there.

Creative Writing

The acquisition of representative products in creative writing requires that ample free time for production be available, and that the assignment be such that creativity is encouraged rather than stifled. The type of assignment which requires that the student write creatively during a given period of the school day inhibits rather than encourages truly creative writing.

Obviously the best measure of creativity in this field would be assessment over a long period of time of all the written productions of a child. Selection of best products could then occur without the limitations of time or of the other demands of the school environment. Under these circumstances there would be opportunity for the child to produce the one or two truly beautiful, original writings which might not become apparent within more limited time requirements.

Time limitations within the present study required compromise. To avoid artificiality insofar as possible, the pupils were asked to use ample available free time during an entire week's span for each type of writing. The directions were open, as were the topics. The teachers reminded them of the request, but any hint of coercion was avoided.

The directions for poetry writing which were given to the teachers were these:

During the week of March 4-8, the classroom teachers will ask the pupils to write a poem: "During this week, will you use your free time to write a beauti-

ful poem. Make it your best creative work. When you have finished it, put your name on it, and put it in the poetry file. Everyone should write one."

Everyone did not, as was the case in other areas, too. For this reason, the numbers of products varied slightly from group to group.

The rating scale (Figure 2) was used independently by the judges. Separate copies were typed of each product, and glaring errors in spelling were corrected to eliminate any possible bias because of handwriting or spelling problems.

Figure 2. Rating Scale Used by Judges of Children's Products in Creative Writing.

Rater_____

Rating Scale—Creative Writing

Directions: Judge each child's product from 9 (highest in group) to 1 (lowest) on each criterion. The distribution from high to low should be approximately even for each criterion. Judgments should be made on the basis of total group performance within each age category. Write in a number (9) for each of the criteria beside the name of each child.

Name of Child	*Originality Dimension* Include here originality; novelty; uniqueness in idea (s) or expression; variety and fluency in output (on qualitative not quantitative basis).	*Effectiveness of Expression Dimension* Include here aesthetic quality; poetic, exquisite quality of communication; impression or feeling of beauty; effective use of elements and/or media.	*Mean*

The following poems were rated high by the three judges. They deal with a wide variety of subjects, and show some evidence of the influence of interests and the season of the year, as well as sex difference. That basketball season was in full tilt is evident in one. Another, entitled Dying Man, contains but seventeen words. A third is obviously written by a girl. Still another uses the theme of the story written for the next example of creative writing in poetry form.

Dying Man

He yells with terror
But nobody hears,

He lies there dead and
In his eyes are tears.

Hazard, Mighty Hazard

It was 103 to 104
And playing time was getting brief,
When Hazard, mighty Hazard
Was fouled by Skip Maureen.

The U.C.L.A. fans went crazy,
They pulled out their hair,
When Hazard, mighty Hazard
Threw the ball in the air.

It hit the basket
And rolled 'round the rim,
And for the Illinois fans,
Things look pretty dim.

It rolled around three minutes,
Then seven, eight, and ten,
And the ball, it got so pooped
It finally rolled right in.

After fifteen minutes,
The referee called time in
Hazard got the ball
And threw it to Erekson.
And after thinking fourteen minutes,
Erekson threw the ball in.

One half second remained in the game,
And Maureen took the ball out.
And that's the longest one-half second
You ever saw,
But finally U.C.L.A. won out.
Yes, Hazard, mighty Hazard, he really gets about.

Is a blackboard alive?
I do not think it is.
But whenever somebody pulls a chalk
Across it too hard, it squeaks.

The wind is a very funny thing
As it whistles through the trees.
Do you know what it really is?
It's when everybody sneezed.

Deep, down, dark and cool.
Where witches sleep and ghosts grow
  cold.
There lies a chest, full of gold.
Deep, down, dark, and cold.

The chairs are stacked on one another.
In hopes of reaching the sky.
I know that they will not make it.
But then neither will I.

The bulletin board is full of holes
From this I say it must be cold.

Africa

The elephant's ears,
  with which he hears,
Sounds that no human can.

And the sounds that he hears,
  with these giant ears,
Prove that he's smarter than man.

He can break down a house,
  yet he's scared of a mouse,
That big old mighty beast.

He'll fight two men,
  or a tribe of them,
But he runs away from a mouse.

The lion,
  mighty king of beasts,
Sits on his kingly throne,

With blood as red as red.

I was alone,
Alone with just me.
And I thought of some thoughts
Just as pretty as could be.
I thought of some fairies
Very pretty you see,
And I thought of Prince Charming
Saying, please marry me.
Some day I'll marry
A handsome young prince,
And we will be happy
Just the two of us.
Now I better put all my thoughts
In my head
And turn out the lights
And go to bed.

Division

Seven divided by seven is one,
Don't go away, we've just begun.

Sixteen divided by four is four,
Can't you see it's fun galore?

Six divided by three is two,
It's not hard, you try it too.

Twelve divided by four is three,
It's so easy, don't you see?

Ten divided by two is five,
It's easier than learning to drive.

Twelve divided by two is six,
If you don't know that, you're in a fix.

Twenty-one divided by three is seven,
If you go much higher, you'll be in heaven.

Thirty-two divided by four is eight,
Hey, this stuff is really great!

Sixty-three divided by seven is nine,
Learn your facts, or I'll resign.

These are examples of poems rated low by the judges:

My Midget Didget Gidget

I have a dog
And she name is Gidget
She is not a Midget
It is not a didget
She is not a midget or a didget
She is a Gidget.

The Sea

The sea oh the sea
Oh I love the sea
The salt heavy on the air.

The Cutter

The cutter is like a swan
Gliding gracefully,
Swiftly, across the cove.

My Friend

My friend is a very special person.
Who is almost always at my side.
She doesn't argue with me,
Whenever I am right.

My friend is good at sports,
And cares a little about boys.
She really is the nicest person
And that is why she is my friend.

For the other sample of creative writing, the teachers were asked to use these directions:

During the week of March 11-15, the teachers will get a sample of writing on a specific topic: "This week we will use our free time to write a story with the title, 'It Couldn't Happen.' Don't talk about your story with anyone. When you have finished it, put it in the story file."

The title, "It Couldn't Happen," was chosen as one which would meet the criteria set forth in Chapter 1. It is completely open, without structure or suggestion, and yet has a title which presumably appeals to the imagination of children. The productivity of the children indicates that it was successful.

The rating form which was used for poetry was also used here, by the same three judges. The contrasts between the high and low examples are obvious. All of the examples for both groups were written by children from younger age groups, except for the last two low items.

Products Rated High. The following five writings were rated high by the judges:

It Couldn't Happen!!

I decided I'd go to the Sports Arena. U.C.L.A. vs. U.S.C. The game starts in twenty-nine seconds. I was in Bel Air. I decided I'd fly. However, even though I flew, I got there 1.1 seconds late! I play on U.C.L.A. In the first quarter, S.C. got the jump. I stole the ball and dribbled down court. I flew up to the basket. SWISH!! S.C.'s ball, (until I stole it). I dribbled up court. . . . I flew up to the basket. Everything looked so small from up there. Well, anyway I "swished" again. I felt kind of helpless up there. I hadn't gotten my permission to land yet. While I was up there, I wrote a 3.121 page book. It is called "A BIRDSEYE VIEW OF U.C.L.A. BEATING U.S.C." by I. M. Flying. Finally (in the last two seconds) I got my permission to land. I made (in the whole game) a total of 2,000 baskets.

It Couldn't Happen

It couldn't happen, or could it? No, I don't think so a greenish dog doesn't put on a show or does he? No, I don't think so. With a purple man who juggles balls and a yellow cow who's an inch tall a rat who runs after cats and a man with 2,000,900 and 8 hats! No, I really don't think so besides I have to go.

It Couldn't Happen

Once upon a time there was a boy named Nancy, a book named Marmaduke, a dog named Ozzie and a top named Harold. They were by the lake when "How do you lift an elephant?" Nancy said. "Put him on an acorn and let it grow," Ozzie said. "You're the smartest dog I ever have seen." Ha, ha, ha, ha, I bet," said Marmaduke, "I'm smarter than you." "OK, what is a spook's Navy called?" Nancy said. "The Ghost Guard," Harold said. "That's what I was going to say." "So answer one," Marmaduke said. "OK I will." "When does it rain money?" Harold said. "When the weather changes." "Very funny."

A few minutes later.

"Help! Help!" "Nancy's drowning, what will we do." "I'll save him," Ozzie

said. S P L A S H! "Help I I just remembered I I can't swimmmmmmm." "Oh brother what will we do?" "You said that, remember I'm a book." "But what does that have to do with it?" "Can you read?" "Yes, but what does that have to do with it?" "You said that," "All right!" "Look up swim and tell Ozzie how to swim." "Smart thinking. First grab Nancy's collar." "OK" "Then move your legs real fast towards land." "OK!" "I can swim." "Thank goodness that's over!" "Yes." "I learned not to brag too." "Good." "You are smart book." And this couldn't happen!

It Couldn't Happen

The Ranger 12 rocket had disappeared! The manned spacecraft Ranger 12 was gone. More than a year overdue.

Lt. Kirk Rogers U.S.S.F. was ordered to take the Ranger 13 to Mars where Ranger 12 was last seen. They were equipped with new atomic blasters. (Later.)

"Okay Lt. Hanson let's bring her in." said Lt. Rogers. "Yes sir" "Don't call me sir it wastes time." "Okay sir." They (the two of them) landed with a thud. "Get your blaster out." said Lt. Rogers. "Okay." came the reply. As they left their spaceship, Lt. Rogers heard Lt. Hanson yell "I see their ship Lt!!"

"Where." "Three o'clock on the starboard side sir." "Good. Follow me." They circled around and entered the first stage. "Let's see now, Ranger 12 has 4 stages so let's get to the top of it." "Okay," said Lt. Hanson. When they got to the third stage they saw that the next hatch was closed and locked.

"Lt. close that hatch we came through." "Why?" "If we open that hatch and they aren't wearing their suits they'll get killed." "Oh," said Lt. Hanson. "Lt.?" "Yes." "How are you going to open the hatch if it's locked on the side." "I'm nuts!" He said "Well I guess you'd better open that hatch you shut."

"Sir it won't open!" In a single bound Kirk reached Lt. Hanson and helped him tug on the hatch. "We're wasting our time Hanson." said Kirk. "Hey wait, our suit levers! With them we can pry this hatch open and leave." They got their levers in place and pushed but the hatch didn't budge a single bit.

Kirk Rogers and Bob Hanson were trapped in the third stage of the rocket with only one hour of air left!

"Try the hatch to the top stage Bob" said Kirk.

"Okay, I'm getting it in place now. Give me a hand, will you?" "All right. Here. Now, one, two, three, push. Uhhhhhhh. There. It's moving. Hey, what's that?"

Kirk was peeping through the hatch, which was open about an inch. He quickly ducked and lowered the hatch. "What is it?" whispered Hanson. "Monsters," Kirk whispered.

"Pull out your gun." "How many?" asked Hanson. "Two of them," came the answer.

"Okay, when I count three, I'll push up the hatch and we'll blast them" "All right. Now. Okay, up, up she goes. Blast. Where are they? Huh? Where are they?"

The Martians had disappeared! They burst into the nose of the rocket and quickly released the men from the section of nose where they were locked.

"What's going on. Have you guys lost track of time? You know, you're a year late!"

"I'm Capt. Johnson. We started out on schedule, but a little less than half way away from Mars we lost control of our ship and it drifted back to Mars, where we were immediately taken prisoners by the Martians."

"My name is Lt. Kirk Rogers. Where are the Martians, anyway?"

"They'll come back. The Martians know how to turn invisible."

"Okay. How are your space suits?"

"They're fine. The Martians didn't take them away."

"Good. How about your blasters?"

"They confiscated them."

"Okay, we've got some spares. Here. And, by the way, can they attack us while they are invisible?"

"No, they can't."

"Okay. Good. The minute you see one, goblammmmmmeeeeeee. In short, get him."

"How many are there?"

"There are ten of them," said Capt. Johnson.

"Oh and there are seven of us. That means someone will get more than the other."

"By the way, why are we waiting. Let's go!"

So they left the rocket and started out towards Ranger 13.

"Bob turn on your ultrasonic demmoscope."

"Okay Kirk," answered Bob. They were half way to Ranger 13 when Bob shouted, "There's something on the demmoscope!"

Then phhht! At the same time Bob yelled "Hit the dirt!" Then blackness. When they woke up they were in a big stone room. As Kirk came to his senses he looked around and saw that the others were still with him.

"Bob, Bob you alright? Thank God."

"They didn't take our blasters." That's the end of his speech.

"How are the others?" said Kirk. "Fine," said Hanson.

"Are they in the same room?" said Kirk. "No, but I have them on suit-radio," said Hanson.

"Okay, let's get a look around here," said Kirk. They got up and started searching. "How did we get in here anyways?" asked Hanson. "Probably a trap door or something," answered Kirk.

"What's this? Something's moving!" said Hanson.

"Good work, Hanson. You've found the trap door," said Kirk. "Now, I have a suggestion. Let's find the others." "Agreed," said Hanson.

So they left the room. "X-24, where are you?" said Hanson over the suit radio. Faintly, an answer came. "This is X-24 in, X-25. We're in the fourth cave on the left side." "Okay, be right with you," said Kirk. They started off at a run, happy over the discovery of the others whereabouts.

When they came to the fourth cave to the left, they pulled out their blasters

and got ready for the expected "phhht" of the Martians' guns. Instead, came "Hi yah, you looking for someone?" "Hello, Capt. Johnson," said Kirk. "Let's get out of here."

So they started off for the Ranger 13. They got there safely in about ten minutes. "Lucky for us they decided to put in some extra seats," said Hanson in a relieved tone of voice. "Concentrated food for the hungry," said Kirk. "Good, let's dig in!" said Capt. Johnson. "I am starved."

"Hey how about the Martians they'll attack if we don't leave Mars," said Hanson.

"You're right," agreed Kirk. "Capt. I hate to cut short your dinner but we had better leave the area."

"Right," said Capt. Johnson. "I don't feel like being tiny." Kirk and Bob grinned weakly.

They got in their acceleration seats and got ready to blast off.

10-9-8-7-6-5-4-3-2-1-0. With a mighty roar the rocket blasted off for earth.

"Well now that we're heading home let's eat. I'm starved," said Capt. Johnson.

"Wait we're being pulled back to Mars," said Hanson.

"You're right!" yelled Kirk.

"Man the orthitonic gun Bob," said Kirk.

"Run ship!" asked Capt. Johnson.

"Have you got your samples, sir?" Good we are going to blow Mars to tiny bits when it's in range," said Kirk. "Mars sighted, we're in range fire!" Nothing happened!

"Try again!" yelled Kirk. No result. "Fire 1—this time use safety!" Brooooom! The spaceship shuddered from the recoil. "And now back to our program Earth." said Hanson.

"At full speed," agreed Kirk, "And now back to your dinner Captain."

So they started out at full speed in their rocketship. "We don't have to do anything to control the ship until the landing, but just in case, turn on the meteorscope."

"Okay," said Hanson.

So after many months, "Earth sighted," said Kirk. "We'll be landing on her in the next two days, but first let's stop at space station #1."

"Okay," agreed everybody.

The next day Kirk, who was watching the TV-scope, yelled, "I sighted Station #1!"

"We'll be bringing her in in two hours, Bob, get on the radio. See if you can contact Station #1."

"Okay, Kirk," answered Hanson.

Capt. Johnson walked up to them "Have you sighted the station yet?"

"Yes, sir. We'll be bringing her in on her approach soon."

"Okay, our men will collect our samples."

Capt. Johnson walked away. "Okay, Bob, let's get in our seats. We'll take her over now," said Kirk. (The ship was moving on automatic pilot.) "Hello, Ranger 13, Ranger 13, come in. This is station #1. Over."

"This is Ranger 13," Hanson said. "We read you loud and clear. May we come in in ten minutes?"

"Ten minutes. Entry Spoke 5 cleared. Over."

"Thanks," said Hanson, "and don't be surprised if we come in early. Two years in outer space is enough for any one."

"I read you loud and clear, Ranger 13. Over and out." Five minutes later. "Okay. Careful now. Bob, I'll take the controls. If I make a mistake, take over."

"Right," agreed Hanson.

Kirk said, "It's time to begin our countdown for bringing her in." Later. "Okay, now, give me a left, 5 steering rockets. Ten blast."

Then the magnetic couplers began to take hold, weak at first, then stronger. The magnetic pull pulled them. And then, with a clank, the ship and the wheel connected. For a moment, they stood silent. Then Kirk said, "Well, we're attached. Let's leave." So, they got out of their ship, and half way to the hub, a messenger came up to them. "Lts. Rogers and Hanson?"

"Yes, that's us," they greeted him.

"Okay," they chorused.

So they started walking to Spoke 6, where they were greeted by a man who said his name was Lt. Col. Harrison. "Boys you were the most recent visitors to Mars. We can't find it on our telescopes. What happened?"

"Sir, we blew it up, sir."

"You BLEW IT UP!" demanded Col. Harrison.

"Yes, sir, we blew it up."

"Why?"

"Because if we hadn't sir, the same thing that happened to the crew of Ranger 12 would have happened to us."

"In that case I'm afraid I must ask you to remove your shiny, new Lieutenant's bars and ask you to put on these shiny, new, freshly polished captain's bars."

"Whaaaaat!" they said, together, a little dazed by the rapidness of happenings, but rapidly gave vent to their feelings. Hanson asked, "Nice, new, shiny —hey, what are these things anyway? They look like captain's bars, but I'm not sure. Nobody had better pinch me. If this is a dream I want to keep it up."

It Couldn't Happen

The Lovely Maiden from the Sun

"I'm expecting a visitor today Harold," said Professor Zwillinger heavily, "and I don't know who it is."

"Now Uncle Pro that just couldn't happen," "Who is it?" asked Harold Bronzen. He and his uncle were over in the lab at the U. of N.Y. Blue eyed dark haired two year old Harold and his white haired nearsighted, farsighted crazy old uncle were looking over the Professor's rock collection. It had won first prize three years in a row, and it was the Professor's greatest possession.

"Well, I have to go Uncle Pro. I have some studying to do."

But as Harold started toward the door, it was suddenly thrown open.

There stood a beautiful girl, all clothed in yellow silk and pearls. She had hair that was like golden flame spilling in long curls down her back. Her eyes blazed sapphires, and her skin looked like snow. But it was her enchanting unearthly being that held Harold and Professor Zwillinger entranced, while she came slowly, gracefully into the lab. She didn't walk, but floated as if on a cloud. Alluring charm she gazed at the two until Harold began feeling very stupid.

He wanted to say "How do you do," but something else slipped out and before he had time to stop it he was saying:

"Boy, you're sure not from this earth!!!"

"No, I am not," said the creature calmly. "I come from the sun and my name is Sundriadieith (Sun'dre'a'die'ith) Sunsariybotic (Sun'sariy'bowteek).

"How do you do, Sundriadieith my dear. My name is Professor Zwillinger and this is my only nephew Harold Bennses."

"Jeepers, you said you were going to have a guest today, but I sure didn't expect this did you?"

"Now Harold don't be rude but I guess I didn't expect this!!" Professor Zwillinger looked a little puzzled.

"I am from the sun," she said slowly, "and the reason why you expected a visitor was because I phoned you but I couldn't get my name through because you earth people don't understand *my* language." "*You people have* a certain telegraph instrument in your mind that reacts when I use a very keen telegraph drum."

"But nothing could exist on the sun, it's too hot!" stuttered Harold, still too dumbfounded to say anything sensible.

"Oh, yes there is, how could I be here." and she continued, "I am made of the same fiery substance as the sun." "Touch me."

Harold reached out his fingers, but the minute he touched her gown . . .

"Ouch!!!" Harold drew away back toward the Professor saying: "Boy, she is dangerous, we had better get out of here!"

"No you shan't, I'm not dangerous. I have to come to ask a favor, this is my story":

"A long time ago my father died and left the throne to my brother and I to rule together. But my brother is four years younger than I and is a spoiled little brute. He has led armies against me, tried to kill me, drive me out of the Palace, but then he did something that really joined me. We have something called the three sunsears, like guns, you know well they were imbedded in the royal scepter which belonged to me. So that brat stole it and threw them every which way. Once he threw them into the air then he decided to go to earth and finish them off there. I managed to slip in with him. The next one he buried in a garden, and the third one he flung in a river. So I have come to ask you earth men to help me."

"But why are the stones so precious to you?" asked Professor Zwillinger.

"Because they protect me from all dangers on the sun under the sun and in the air," answered Sundriadieith.

"We'll help you, don't worry," assured Harold.

"Sunny will search the river, Uncle Pro will search the flower beds and I'll look at the ground, right near the sun," he added hopefully.

So Professor Zwillinger with his rock collection, Harold, and Sundriadieith went out of the lab and hopefully began to search. The professor, balancing in one hand his rock collection with his other hand plowed unsuccessfully dirt rooting up flowers. Sundriadiecti daintily trod along the banks of a stream, burning up a good part of it too. And Harold went on hands and knees on the ground.

After an hour with no success the Professor suggested that Sundriadieith look over his rock collection for awhile. All of a sudden her face got red and it looked as if she was going to have her own small fire.

"Professor Zwillinger," she said in a frightful way, "You have my three gems!!!"

"Oh I do, excuse me," Professor Zwillinger backed away and hurried by.

"Here you can have it." He tossed her his big white box.

And from all these rocks, and stones, papers, pennies and books, Sundriadieith managed to pick out these large stones something like a topaz. She told them that she had to go back to the sun. The beautiful maiden handed Harold and the Professor a small thing like a music box with a telescope attached to the end. "You can see the sun from there," she said smoothly.

"Tune in about 3:00 and I'll be lecturing my brother."

"But what does the three S'es on the side of the gem mean?" asked Harold.

"It means: the Sunny, Sultan of the Sun!"

"You know I never knew it meant that when I found it." said the Professor, "I found one in a potato which I was trying to eat, the next one Harold found by the creek near the lab, the third someone said he found by the steps of the lab, he has seen it come crashing to earth right under the sun.

"I have to go dear friends, good bye." she called drifting on a sun beam.

"But wait," called the Professor, "That's my rock collection you have, aren't you going to bring it back?"

"I gave you a present," she called "anyway it will be great i n t e r e s t on the sun. . . . . "

Her last words were hard to hear as she rose slowly in the air and departed.

"Hey it's almost three now," called Harold, "let's go!"

They tuned in on the sun and sure enough she was saying:

"Ah, my brother, those miserable creatures," she began and Harold could have sworn that she winked at him.

Products Rated Low. Examples of writings rated low by the judges follow:

It Couldn't Happen

I was listening to the radio when Mom comes in and says, "Turn those Beatles off." Well, I was thinking what she would say to my sister Connie.

Connie is my older sister and is sixteen. She has twenty-four Beatle pictures in her room. She even has a Beatle record.

My Mom has got something against the Beatles. She doesn't even let Connie look at the Beatles on T.V.

Do you think my Mom will get to like the Beatles? P.S. My answer is NO.

It Couldn't Happen

I was walking down the street. I met a green eyed blue mouth purple face coming toward me. I ran for my life. But I found out that he was pretty nice but I still ran because of his face was so wicked.

It Couldn't Happen

It could not happen if I was on a tennis court by myself and played mixed doubles by myself. I would have to have three more people playing mixed doubles with me on the tennis court.

It Couldn't Happen

Once I was walking down the street, minding my own business when I saw the most strange thing. I couldn't believe my eyes. It was man with three heads, six arms, two noses, eight legs, four eyes on each head, two mouths on each head, and four ears on each head. He was the most horrible man I have ever seen.

He said to me "Hello." And then he said, "Come with me to Mars. I have been looking for you for ten years and I have finally found you. And either you come with me or I will kill you right now.

"Okay. But what are you going to do to me?"

"You will find out in a little while, right now you must come."

"I want to know why you want me and I will hold my breath until you tell me."

"Don't do that," he said, "I will tell you, you see, I'm from Mars and I was elected to bring you there so you must come now."

"No I will not come."

"But you must and you must come quickly or I am going to have to kill you."

"No I will not come."

BANG BANG

It Couldn't Happen

Yes, it could happen. No, it couldn't happen. But it happened. Paul was right. It happened. The man came. Then two men came. Then three men and then four. They came in the house Paul was scared. But then his father woke up. The men came closer and closer. Paul got out of bed. He climbed out the window. Then he ran.

It Couldn't Happen

A cloud could not come down to earth, it just couldn't. Because gravity will not bring it down. Rain can come down because it's rain but not a cloud, no not a cloud!

It Couldn't Happen

A person could not run a mile in two seconds because people can not run at supersonic speeds.
If someone did it would be wonderful but it won't happen.
If it does happen it won't happen on this planet.
And I will be dead before it happens so I wouldn't see it happen.

Can't Happen

One day I was going to the store for some milk and I found that I had a gallon of milk in my cans so I did not have to go to the store.

Social Studies

The field of social studies includes many areas of human behavior and performance. Adequate sampling here is difficult when one considers possibilities in sociology, psychology, history, geography, anthropology, and so on. The decision was made to sample through two problems structured to the children's ideas on ethics or ideals and in problems involving the survival of man. The problem of ideals was based on their view of Utopia, and was presented in these directions to the teachers:

During the week of March 9-13, the teachers will use two periods on different days of up to one hour each to have the children write an essay on each of the subjects below. Teachers may give help with spelling, or assist with composition if needed, but should *avoid any suggestions or ideas.*

The teachers had extra student help available so that the children had ample assistance for spelling or other problems. These were the directions to the children for the first essay:

Have you heard the word Utopia? (write Utopia on board.) Utopia was an imaginary land where the total living conditions were perfect. Today I'd like to have you give some thought to your idea of Utopia, and write your version. Use your imagination. Head your paper "My Idea of Utopia," think privately about your own ideas of a perfect land, and then take whatever time you need to write on the subject until (time). We'll help you with spelling if you wish.

The criteria for evaluation were the same on the originality dimension as in the creative writing evaluation (Figure 3). The reader will

note, however, that the effectiveness of expression dimension is the same as for the science evaluation, and differs in description from those used in the aesthetics oriented categories.

Figure 3. Rating Scale Used by Judges of Children's Products in Social Studies.

Rater_____

Rating Scale—Social Studies

Directions: Judge each child's product from 9 (highest in group) to 1 (lowest) on each criterion. The distribution from high to low should be approximately even for each criterion. Judgments should be made on the basis of total group performance within each age category. Write in a number (9) for each of the criteria beside the name of each child. Add: Mark X before name of any child judged to have irrelevant but potentially valuable ideas.

Name of Child	*Originality Dimension* Include here originality; novelty; uniqueness in idea(s) or expression; variety and fluency in output (on qualitative not quantitative basis).	*Effectiveness of Expression Dimension* Include here appropriateness of solution, logic.	*Mean*

High Ratings. The first four Utopias of the high group which appear next are from the older children's group, while the last two are from younger children. The examples vary in length and content, but all express interesting and appropriate ideas outside the immediate, personal level of reference.

My Idea of Utopia

In my mind's eye I see the perfect land. A land with everlasting peace. A land where every man has the rights of his neighbor. The place of perpetual health, happiness and not just wealth but riches for every man. No slaves no atom or H-bombs, but brotherhood for all. A world of knowledge for every

man, woman, and child. A world not only rich in money but in life. If our world could be this way, it would be perfect.

Utopia

My idea of a Utopia would be in a place where there's sun in summer and snow in winter. There would be colorful leaves in fall and flowers in spring.

There wouldn't be any wars or battles between countries and there would be peace everywhere.

There would be many challenges and discoveries of cures for sickness and things to help us live better and more comfortably. There would be new discoveries or rockets that go very fast and explorers who explore space, the sea, land, and everything. There would be new transportation.

There would be no fighting between people or breaking of laws.

There would be busy places like New York and peaceful places in the country.

The arts would be developed and we would have many famous artists and musicians.

There would be a lot of recreation *from* baseball to chess. There would be very many famous players of these games. Most of all there would be freedom.

My Idea of Utopia

My idea of a Utopia is that all the people would be born with advanced minds so they would know almost everything they need to know.

There would be no bad people and you could live forever and stay at any age you wanted.

All people would have equal rights.

Everybody could have all the money they wanted.

You could get anything you wanted by pressing a button.

Your cars could fly by air pushing down on the cement or ground.

I would not make the whole world perfect because then everybody would be lazy and there would be no excitement.

My Idea of Utopia

Good schools. Have children get a lot of allowance. Have more good hills for skate boarders. And have more amusement parks. Have jet cars. Have portable houses. Have portable roads. Have automatic homes. Have a mechanical man to take you around. And butlers. Have the public give air tickets to everybody. I guess that's about all.

A land where they always have fun, and there are no bosses to boss you around. And no baby sisters. And have a XKE to zoom around in.

My Utopia

Utopia is a place where people don't gang up on others. And people remember that other people have feelings and opinions.

Utopia has a fair amount of schools and teachers.

Utopia has a place where if you have a picture of something you can get a model of it.

But most of all it observes, "Peace on Earth Good Will to Men."

But still teaches you to stand the hard knocks of life.

That is my Utopia.

My idea of Utopia is to have everybody happy and well cared for and prosperous. I have a nice, comfortable house and I have everything I want except a new dress and a sweater. If the world was happy and beautiful I'd be very happy.

First, I'd take down a lot of the buildings and put up trees, only because they cut down the beautiful plants before. I'd plant White Birches, Cotonwoods, Maples, Sycamores, Flowering Apricots, Dogwoods, Flowering Peacies, Elms, Apple trees, Spruces, Redwoods, Aspens, Acacias, and many more. I'd plant flowers, new emerald green lawns, from old shabby brown ones and fix up houses. They would need a new coat of paint, new fencing, and doubtlessly a few white organdy curtains with silk sashes, and a few new things inside.

The trash and the poverty in the world would vanish in my Utopia. Wars would puff into thin air as easily as a thread breaks when you pull it.

I would care for the poor and sick until they would not be poor or would not need my help.

Also all men are created equal. Negroes would have their rightful place in fame and state, they would go to school and learn and have jobs, no matter in just California, but in Alabama, Mississippi, Georgia and everywhere. Underestimated people, just because their skin is a different color, would be given an education, a job, and if necessary, a house and car. People all over the world who are neglected too poor to go to school, who don't have clothing and food. They come first! Milk, bread, meats, paper, books, pencils, pens, blankets, crayons, shoes, skirts, blouses, pants, coats, underwear, sweaters, are things *they* need and not us.

School would be just a little later though I'm always up at the crack of dawn. I'd read all the books I could get my hands on, only a certain kind of fiction and non-fiction. I would have a pink and white feather book marker and I'd hope to be a *whiz* at math. I'd hope all the stories I'd read would be good, I could finish them quickly. I wouldn't want to be real selfish, but have all the world be gay, free prosperous, nice and treated equal in my Utopia!

Low Ratings. For contrast, the same number of examples, four from the older group, and two from the younger group, are presented for the total group rated low. Self oriented and less mature expression is evident here. The low rated Utopia is personally centered around the individual, with less concern for society as a whole. The emphasis is largely upon immediate self gratification. The contrasts support the findings in the California study, in which the gifted showed much ear-

lier concern for the well being of others, as indicated in their admiration of those who made remarkable contributions to the welfare of society, rather than of those who contributed to their own pleasures.

My Idea of Utopia

My idea of Utopia is when I have a billion dollars and I have a Rolls Royce, servants and servants servants and I can just lay around in my own mansion. Give a hundred dollars to every poor person in my country.

And I'd like to own a whole chain of department stores. Have all of my money in a bank I'll buy out.

Then I'll buy all the stock I can buy and let other people buy stock and then draw out all my stock out and let the other people gain a little then just take out all my stock and I will have gained a thousand.

My Idea of Utopia

I had a dream the other night. It was a wonderful dream. It was my own idea of utopia.

The setting was a fresh sunny day in Palm Springs after a good bacon and egg breakfast at the coffee shop of the Riviera Hotel—my parents had bacon and eggs too, but my little brother ordered a king size plate of pancakes. He ate all fifteen of them in ten minutes.

When we got back up to our hotel rooms we all put on our bathing suits and went swimming in a big pool. We swam and relaxed till lunch time. Then my dad went out and got us all submarine sandwiches.

After lunch we went up to the tram for about an hour. We played in the snow and had a snowball fight.

When we all got home we took warm showers. My dad and mom went to play a fast game of golf, while my brother and I watched television and played.

When my parents got back, we all got ready to go out to dinner. We did not know where we were going, but we knew it would be some place nice because we were all dressed up.

We got in our Continental car and drove away. We stopped at the Chee Chee Club and went in for dinner and a show. We did not have dessert because we wanted to go to Will Wright's for a triple decker sundae.

That was my dream of a wonderful utopia.

My Idea of Utopia

If I owned a planet I would set up a government, (I would be head) build 200 castles, 95 ships of the line (the type used by Nelson), a true to life replica of Nelson's 104 gun flagship Victory, 150 frigates (all built like the USS Constitution), 80 brigs, and 120 sloops, and enough men to sail and enough water to sail on.

After doing this I would make a decent population to each country (depending on size), and to people on earth except good friends, Pooh!

For teachers in schools I would have great fighters like Nelson, Genghis Kahn, and Attila the Hun.

My Idea of Utopia

My idea of Utopia is to have a nice house and a nice family. And nice friends. I would like to travel a lot too. And where there is no one who steals and is selfish. And where it is cool and not too hot.

My Idea of Utopia

Utopia is a place where there is no school and the people are smart. I think it is a "wonderful" place.

My Idea of Utopia

I have been to Utopia and most everything goes right and I was there about three years. I have seen and done almost everything I want to do. I have been so busy I have not been able to stay home at all and I even came home to Los Angeles late too. My mother and father asked me why I came home late and I said I had had such a good time there I didn't want to leave but finally decided to come because I hadn't seen you for such a long time.

The second social studies problem involved the problem of survival. The following situation was presented:

Today will you think about the following situation and write your ideas. Suppose you are suddenly stranded on a South Sea island which has some vegetation and small animals, but no people. All you have with you is a small wash basin, an old inner tube, and a Sears catalog. What can you do to survive?

Products Rated High. The examples of the high group revealed much ingenuity, and seemingly reflected enjoyment of the topic. The first four from the older group, and the last one from the younger group, show the wide range of imagination which the children applied to solve the problem.

My story begins when the ship I was sailing on sunk, and I found myself hanging onto a small old inner tube that somehow floated to this small deserted island where no one lives.

In the last week I have survived with the things that I hastily stuffed into my pockets and the insides of the inner tube. The first thing that I did was to drag myself up to small clump of yellow bushes where I fell asleep for a long time (later after further exploration I found that there was little vegetation on the island and that the clump of bushes would have to become my home).

When I awoke I was quite hungry and wondered whether there was any prey here? As this thought passed through my mind a tiny black rabbit scampered in front of me. Something about the rabbit looked familiar—ah yes—the black rabbit was the same color as the inner tube—and then the ideas began hitting me, why not take a little bit of the inner tube and make a sling shot?

As soon as I had finished my small but strong sling shot I went hunting. After a half of an hour of working to make a fire by rubbing two sticks together I had three rabbits cooking and two eggs frying in a small homemade fire pit (I found millions of egg nests in my shelter).

The next morning I did many things, I would not have remembered them all if I had not written them down on the pages of a Sears catalog book (I wrote with the stub of a pencil that was in my pocket).

This is what was written on the pages.

Oct-Nov

Found a few berries for eating.

Used the bones of the rabbits for a fishing pole

(fishing became one of my main sources of living) caught fish around the island.

Used the skins of rabbits for a cover to keep me warm at night and a door to my house.

Found a few cocoanuts—used them for drinking—saved most for winter.

Dec-March

Became cold.

Made myself clothes out of the rabbit skins.

Found a few nuts—very good ones too!

Used an old wash basin for storing my food—washing clothes.

I enjoy my life on this island even though it is hard and I am always busy training birds and all other animals.

P.S. I plan to stay on this island!!

An Inner Tube, a Wash Basin, a Sears Catalog, and a Stranded Kid

At the age of ten, I was stranded on a South Pacific Island. All I had was a small wash basin, an old inner tube, and a Sears Catalog. There was some vegetation and there were little animals all over the island.

I was very hungry at times and thought I could smother an animal in the inner tube but I just didn't have the heart. The vegetation kept me pretty good though. It supplied me with fresh water too.

The animals there became my friends and the way I spent the day was playing with them, swimming with my inner tube looking in my Sears Catalog, exploring the Island, counting the stars at night, and a lot of other things. In fact, even though I was stranded I found an infinite number of things to do.

I made a place for shelter and slept there. I learned how to live there.

One day I took my old inner tube and went for a swim. As I was floating a rip-tide caught me. I thought my inner tube was going to blow up but instead it carried me to another part of the island. Suddenly I heard some music and

dancing. I walked on the island and found myself on the beach of a fancy hotel in Tahiti, where even naturally there was plenty of food and also the hotel.

Four days I had been on this dismal island without food and only a small basin of sea water that I was trying to purify. I had used an old inner tube that I had with me to strangle some monkeys for food, but now the meat was gone and I hadn't found anymore animals to kill. I used a Sears catalog to get birds with and I must say I think my way is quite clever. I would tear out the colored pictures and lay them on the ground. When the birds came down I would club them. But their meat is hardly nothing and so now it is back to starving. Each day I do more and more work on a small boat I am building that takes me to a civilized island, without poisonous plants which is the only kind of plants that this island has.

Stranded

Well, here I am, stranded on a desert island. I've found the island has all sorts of vegetation and small animals. But also no people. Now to get the island civilized. First, I must make a signal fire, then a lean-to which I shall live in until I may build a hut, and then I shall eat and go to sleep.

Phew, now lets see signal fire made, lean-to done, now to gather some fruit. This plant is very spicy I wonder what it is, Oh I feel very sleepy all of a sudden.

What am I doing here, oh now I remember. Wait the little water basin is very large, wait I've shrunk. I'd imagine I'm about two feet two it must have been that plant I ate.

I know how to escape!! That water basin is bigger than me, and that inner tube is full of air! I can put the basin on top of the tube and have a float. I can weave bamboo fibers together for a sail and rig up a mast, collect lots of food, and bring along the Sears catalog to read.

Today is my last day on this island. Tomorrow I leave.

That Island

I remember it. It was twenty years ago. I was prisoner aboard the Jap battleship, Yamato. We had been under air attack all day. During the confusion, I dived over the side to a nearby island. Little did I know that it was uncharted.

When I landed on that island, I knew it. I looked at my earthly possessions —an inner tube, a Sears catalog, and a wash basin?

There was vegetation, fortunately many kinds. Also animals. Fortunately, some were fit to eat. I lay down in the sand and went to sleep. When I woke up, I found that the sun was dipping beneath the horizon. I saw some thorn bushes and a rock that looked sort of like the handle of a knife.

"Why don't I make a knife out of it?" I thought. I picked up the knife-han-

the sharpest rock and walked to the nearby shore bank. I broke off a thorn and forced it into the rock. It went in, but it didn't stay in.

I placed some wood in a pile and placed my wash basin on top. Then I put my inner tube in it. Then I made a fire, Boy Scout style. (Funny, I never did like the Cub Scouts).

It didn't burn very well, so I muttered to myself "Sears and Roebuck is going to kill me."

And I tossed my catalog into the fire. The flames leaped up. There was a burning rubber smell. After a while I took the inner tube out and worked it into a thin strand and laid it out to dry. After a while, when it was dry, I made it into a loop, put my foot on top of it and pulled, breaking it. I took the shorter length and tied the thorn onto the rock. Then I walked over to a nearby tree. I climbed up and I got on to a branch with lots of coconuts. I hit it five times with my fist and climbed down. I picked up the coconuts and one by one I slit the tops, drank the juice, cut off the top, and pulled out the meat with my hands. After eating the coconuts, I put down the coconut shells for a while, and went to sleep. When I was sleeping, I dreamed that I was carving out messages on the coconuts with my knife. When I woke up, I immediately jumped up and started carving a message on the coconuts.

I wrote, "Help! Am stranded on South Sea Island, unchartered. In vicinity of attack on Yamoto on Dec. 15, 1944 at 1200." After doing this on all the coconuts, I looked around and saw what I wanted to see—a big plant with bright yellow leaves. I walked up and ripped off ten of the leaves, one for each coconut. I found ten fairly long sticks and stuck them through the leaves. And then I stuck the other end of the stick in the hole in the coconut. I started up to the shore and walking around the shore, I sent off one message every ten paces. Then, feeling satisfied, I picked up my knife and killed two rabbits. One I put in an extra coconut shell to preserve, and the other I pulled apart, put some of it away to preserve, and the rest I cooked over the dying remains of my fire.

That one lasted three days. I just started on the other, but I don't know how long it would have lasted. I was picked up by the U.S.S. Radford on the 1st day of eating the second rabbit. It took some time, but after a while, they finally figured out I was there. Actually I signaled by sewing fire to a coconut tree. They lowered a motor boat and picked me up. I was picked up on Dec. 17, 1944.

Products Rated Low. The following are examples of solutions which were rated low. They are again from children in the older group with the exception of the last.

DESERT ISLAND

I was stranded. But I had a Sears catalog and an inner tube and a wash basin so I ordered a motor boat from Sears and some gas and was off for home. How I got my order through, I put it on the inner tube and in a week I got my motor boat.

[illegible]

I was stranded on an island. No people but I were on the island. I had a sharp rock so I carved writing into a page of my catalog. I folded it into an airplane and flew it. It fell hopelessly into the water. I saved a little of it and the rest I burned by rubbing two sticks together. It seemed like it was years before one of them began to smolder. I lighted a part of the catalog and caught a small animal which I readily cooked and ate it.

I did not need my boots so I just left it to lie. When I ate it was four times of vegetation to one animal.

I knew that I was miles from any other land so I finally burned my old inner tube. I just kept on living on the vegetation and once in a while when my aim with a rock was good enough I had an animal.

I had survived.

[illegible]

I had been ship wrecked a couple of miles off shore of a deserted South Sea Island.

When my ship sank all I could save was an old inner tube, a small wash basin and a Sears catalog.

I floated to shore on the inner tube.

In the wash basin I had taken as much fresh water as possible from the ship.

I soon found out that there was small game on the island such as rabbits, squirrels, and a few birds.

I set up traps which were holes in the ground I had made with my hands and put leaves over it.

For three days I didn't eat and I was getting weak from hunger.

Finally on the fourth day one trap worked and I got a rabbit. I made a fire and cooked it and had a good dinner.

I caught more game, cooked them and put them in the small wash basin.

I sailed off in the inner tube and after two weeks of floating a boat picked me up and I was safe and went home.

[illegible]

I had been stranded on a South Sea's Island for three days. I was sick of it. So I took my inner tube and sat down on it.

I looked at my Sears catalog. Then I saw something in it I wanted. So, ... I got my inner tube and put the note in it.

Five weeks later it arrived. Boy, was I ever happy when it came. It was a do-it-yourself house, a do-it-yourself robot, a do-it-yourself car (it was a Jag. X.K.E. by choice) and a do-it-yourself telephone and T.V.

This was really living. But soon I wanted something that could make me rich. So I got my catalog and sent in for a do-it-yourself restaurant and fifty do-it-yourself robots.

Well, I get about $500,000.01 a day.

Well, being stranded isn't too bad if you can make that kind of money in only one day.

I'd look in the Sears catalog and see what was the best way to kill an animal with an inner tube and a wash basin. If I didn't find any then I would send an air mail to Miss_____ and ask her to send a ship out (of course I would invent a kind of paper and dig up a pencil). And then I'd be safe.

Rhythms

Interpretive rhythms were chosen as the category in music in which judgments of children's performance might be made with the least artificiality. Consideration of children's musical compositions was ruled out because of the obvious need for an unlimited time span. Children's performance in instrumental and vocal music would have created numerous problems, among them the need for multiple criteria, complicated scheduling, and the influence of direct outside teaching, in the case of instrumental music. Outside influence can cause problems in rhythms as well, but the use of relatively abstract and unfamiliar music serves to minimize the effect of special teaching.

The direct filming of interpretive rhythms done by small groups appeared to be the best single avenue to evidence in one realm of musical performance. Through the medium of films, it was felt that judges could get cues to both children's understanding of music and their interpretive skills.

The children at the University Elementary School were accustomed to the performance of rhythms as a normal part of their school life. The fact that rhythms are a regular experience throughout the elementary school years served to reduce the artificiality which might have been a problem in another environment.

It was necessary to divide the children into groups of approximately fifteen each, in order to allow space and to establish groups of reasonable size for the cameramen. The children were assigned code letters and numbers, which were also recorded on the rating sheets. The judges viewed films of children wearing large block letters or numbers, and assigned single ratings in rhythms to each child after viewing two kinds of performance.

One of the performances involved the rhythmic interpretation of the descriptive music of *Phaeton* by Saint-Saens. The story was first read to the children, who then listened to the music. They were then asked to portray through movement the story as described in the music.

The other film was made of the children's rhythmic interpretation of "On the High Plateau" from *Realm of the Incas*, by Elizabeth Waldo.

The music was played once for the children, but no comments were made. They were then asked to respond on the second playing.

To eliminate as many variables as possible, uniform directions were given by one individual, an expert on children's rhythms. The filming was done by the same crew on the same day, in the usual rhythms room of the school.

The rating scale employed the same categories as those in other aesthetics oriented areas (Figure 4).

Figure 4. Rating Scale Used by Judges of Children's Products in Rhythms.

Rater_____

Rating Scale—Rhythms

Directions: Judge each child's product from 9 (highest in group) to 1 (lowest) on each criterion. The distribution from high to low should be approximately even for each criterion. Judgments should be made on the basis of total group performance within each age category. Write in a number (9) for each of the criteria beside the name of each child.

Name of Child	*Originality Dimension* Include here originality; novelty; uniqueness in idea (s) or expression; variety and fluency in output (on qualitative not quantitative basis).	*Effectiveness of Expression Dimension* Include here aesthetic quality; poetic, exquisite quality of communication; impression or feeling of beauty; effective use of elements and/or media.	*Mean*

Composite judgments on rhythms were made for each child by the three judges after viewing both rhythms. The judgments were made independently. The films were run repeatedly to give the judges opportunity to form impressions, to increase discrimination in their choices, and to evaluate their final impressions.

Art

The art products of the children were paintings and clay products. As was customary, the children painted and made their clay objects in the art room, under the direction of the special art teacher. This type of art experience is supplementary to art in the usual classroom, but since it occurred on a regular basis, the acquisition of products through uniform circumstances by the same teacher was possible.

Calcimine was used for the paintings. The teacher provided all of the children with a wide selection of colors, and worked with them in their usual peer groupings. The directions given were simply:

> Today you are free to paint anything you wish. Use your imagination and your ideas. I won't work with you or help you in any way.

Figure 1. Children's Paintings Rated High and Low by Judges.

High

Low

High

Low

The paintings (Figure 5) showed a wide range from crude, literal and limited representation, to greater skill and effectiveness in interpretation in those rated high.

The clay products (Figure 6) were all made from red clay. The same directions were given, with again evident wide variations in the results.

The children's products were arranged by class groups for the judges. The evaluations of both paintings and clay were made for each class group as a unit, so that wide age differences would not become a factor. Independent judgments were made of each child's work.

Figure 6. Children's Clay Products Rated High and Low by Judges.

High

Low

High

Low

4
Comparison of High and Low Ability Groups

Comparisons were made of the performance of the high and low groups on selected tests from those devised by J. P. Guilford and his associates (1963) at the Aptitudes Project Laboratory of the University of Southern California. The Guilford tests were used in preference to others, since no validated tests of creativity in children are yet available, and since most of the tests which have been used in studies are adaptations of those by Guilford.

The Tests

The particular tests used were those designed to tap divergent thinking abilities. The divergent thinking tests are composed of problems and situations which test originality, ingenuity, and flexibility or adaptability. Those which seemed appropriate to the developmental level of the children were chosen, and were used with no adaptation except in the case of one (Match Problems II), where the vocabulary in the directions was simplified in a few instances through the use of simple synonyms for obviously difficult words.

The tests used were the Match Problems II, Association, Utility, and Consequences. The Match Problems II test is described as a test of figural adaptive flexibility. The tasks require that the subject take away a prescribed number of matches to leave a certain number of squares in a figure composed of multiple squares or triangles. The Consequences test taps ideational fluency and originality, and consists of ten questions, starting with "What would be the results if ?" in which the subject lists as many results as he can. The Utility test measures semantic spontaneous flexibility through the listing of differing uses for a common object. The Associations test requires the listing of a word that is associated with thirty sets of two given words as the following coined examples:

baseball	(run)	stocking

The divergent thinking abilities tests were chosen because of the view of Guilford and Hoepfner (1963) that "creative thinking is most dependent upon divergent production and transformation abilities."

Guilford states that differentiable factors of intellect in the divergent production area become apparent before the age of ten. He states also that the differentiation of the less able, one from the other, is relatively unreliable with the divergent thinking tests, but that "differentiation is almost uniformly good at levels beyond the median" (Guilford & Hoepfner, 1963).

On only one of the tests used in the present study, Association, were there any significant differences between the high and low groups. On this test the differences were significant at the 5 percent level, possibly because of vocabulary differences. Verbal competence probably is important on this test as well as on parts of the individual intelligence test, in that a good vocabulary should provide a basis for better response than would a limited vocabulary.

As Table 1 shows, the performance between the high and low groups on all of the other tests was very similar, with no significant differences on the divergent thinking tests.

TABLE 1

Statistical Data from Guilford Tests

Test	*Group*	*Mean*	*SD*	*t*
Match Problems II	Low	5.6	3.6	1.30
	High	6.3	3.3	
Association	Low	2.7	2.4	2.16*
	High	3.9	3.1	
Utility	Low	5.5	3.3	.87
	High	6.2	3.4	
Consequences Obvious Score	Low	99.6	12.0	.19
	High	99.3	9.2	
Consequences Remote Score	Low	3.2	3.0	1.73
	High	4.5	4.3	

* Significant at 5 percent level

The assumption might be made that the divergent thinking tests provide limited sampling because of problems imposed on the children by the fact that writing was required and time limits were set. These problems did not hamper the children's production, however, as comparisons of the elementary children with engineering students at the University of Southern California and marine officers indicate.

The means for the children on the Consequences test (obvious score) were 33.6 and 33.3 with standard deviations of 12.0 and 9.2; for engineering students the mean was 37.7, with a standard deviation of 14.1; and for marine officers the mean was 25.9, with a standard deviation of 9.1. The children's remote scores were smaller than those of the engineers (16.6) and the officers (7.9), but the total number of ideas produced compared favorably. The children produced more total responses than the marine officers, and therefore it appears that sampling was adequate. Comparative data were not available on the other tests.

The divergent thinking tests used here did not reveal differences between the two groups of children except in one instance. The test functions are apparently quite different from those of the individual intelligence test.

TABLE 2

Interjudge Reliability Correlations for Various Products

Test	*N*	*r*
Desert Island	58	.58
Poem	62	.14
Rhythms	104	.83
Prose	64	.25
Art (painting)	75	.45
Science	108	.52
Art (clay)	98	.95
Utopia	68	.43

Table 2 presents interjudge reliability data for the various products. Within this study, judgments were made without the kind of careful, detailed training which is obviously desirable. With adequate financial support, a preparatory period, a pilot study, preliminary analysis of results, and possible retraining would all be possible. The fact that the only training occurred through discussion of the meaning of judgment criteria is reflected in the disparate correlations reported in the table. The well known problem of agreeing upon terms related to creativity no doubt adds to the difficulty.

The two lowest correlations occurred in relation to poetry and prose. In these two categories the judges obviously disagreed on the extent of originality and effectiveness of expression in the stories and poems of children. Other areas, including science and social studies, fared better, ranging upward to correlations of .83 for rhythms, and .95 for clay products. Perhaps one reason for this is that in the social studies and science areas, ideas could be categorized qualitatively more easily than in creative writing.

An advantage to the judges in both rhythms and clay was that they could view an entire grouping, and rank order the performer or product as they wished. The judges viewing the films of rhythms were able to ask that the film be re-run many times as they judged individuals and noted their own evaluations. Similarly, the judges of clay products each took turns viewing an entire grouping of products, and attaching comparative ratings within the grouping. They could move clay pieces into categories rather easily. This is not as easily done with large sized paintings, or with topically unrelated material, such as was the case in creative writing.

Products

In the course of several months, various child products were collected and submitted to independent judgments by three experts, who utilized the nine point scales of originality and effectiveness of expression previously described. These judges had no information on the abilities or backgrounds of any of the children. The effort was made to clarify the meaning of the terms originality and effectiveness of expression, both through qualifying adjectives and explanations on the rating sheet, and through discussion with the judges. The choice of experts with the special qualifications for making judgments serves to enhance the validity of results.

Judgments were made independently by each of three judges on each child's product for a given field. The rating on a product for originality and effectiveness of expression was combined into a mean rating. The three mean ratings of the judges for a product were then combined for a mean product rating. The product ratings were divided into high and low groups.

The judgments on products produced a clear difference in several areas in favor of the gifted. On evaluations of the poem, the difference favored the gifted at the 5 percent level of significance. Evaluations of the story "It Couldn't Happen" produced very significant differences in favor of the gifted at the 1 percent level of confidence. The evaluations on the writing about Utopia, on the science problem solutions, and on the rhythms performances likewise produced highly significant differences in favor of the gifted at the 1 percent level.

The only topics on which no appreciable differences were found were the writings on the problem of survival on the desert island and on the two art products. The frequent comments of the judges about evident teaching of certain techniques which were apparent in both the paintings and clay products may have been a factor in the latter case. The techniques could serve to diminish differences unless widely

varying and numerous techniques were taught within reasonably limited time spans. This is possible in an art school but not in a school where children have only scheduled contacts with the special teacher.

The differences between the high and low groups are shown in Table 3. The differences in number of products are due to various uncontrollable factors almost predictable in field research in a school setting. These factors include childhood illnesses, competing activities, leaves of absence, and others.

TABLE 3

Relationship between 1960 Binet IQ Scores and Products

Group (N)	*Product*	*Chi Square*
Low 45 High 45	Poem	4.41*
Low 38 High 42	Story	7.48**
Low 34 High 45	Utopia	9.25**
Low 48 High 45	Desert Island	.83
Low 36 High 49	Science	14.22**
Low 33 High 44	Rhythms	13.51**
Low 51 High 44	Clay	.14
Low 49 High 46	Paintings	.11

* Significant at 5 percent level
** Significant at 1 percent level

In a variety of tasks which were planned to assess performance, the gifted group proved able to produce qualitatively better products than the average group. The tasks provided opportunity for the judges to evaluate both logic oriented and aesthetics oriented products. The gifted group not only wrote qualitatively better poems and stories, but also presented better ideas on the constitution of a perfect society (Utopia), gave better solutions to space problems, and displayed better understanding and interpretation of music through rhythms. The high group identified through the individual intelligence test exhibited

abilities which transcend the presumed limits of the test itself. The differences are not surprising to anyone who has worked with identified gifted children and has had opportunity to appreciate at first hand the universality and complexity of their abilities and talents. Teachers and others constantly attest to the diverse and superior talents these children demonstrate if they are given the proper opportunity to do so.

The assumption is that creative thinking is most dependent upon the divergent thinking abilities (Guilford & Hoepfner, 1963). If one were to assume that the extensive judgments of products by experts had any validity in identifying creativity in children, then the close relationships between products and measured intelligence on the one hand, and the negligible relationship between divergence tests and intelligence on the other hand is interesting. Why does this occur?

Ratings by Teachers

The teachers of the participating class groups were asked to name the five children within their respective classes whom they regarded as the most creative, and the five who were the least creative. Since one of the classes had three teachers as a team, this meant that seventy nominations were made. The judgments were requested so that the nominations of the teachers could be compared with the performance of the children on judged products.

A total mean product score was derived for each child, and the individual was assigned a high or low rating. When the teachers' ratings were compared with the ratings of the children as assigned by the experts, it was found that the teachers were able to select accurately 75 percent of the children who were judged low, and 54 percent of the children with high ratings on products. The latter rating is roughly comparable to the findings of various persons who have assessed the ability of teachers to nominate gifted children in their classes, and has interesting implications. In the earlier work of Terman (1954), and from later studies by Pegnato (1955) and Walton (1961), we find consistent agreement that teachers succeed in nominating about half of the children as gifted who on later tests are found to be mentally gifted (Martinson, 1962). This has been true despite the recent development of trait scales and other devices which presumably would increase the skills of teachers.

The identification of abilities by teachers is possible only in an environment which freely permits the actual demonstration and use of the abilities. The person who deviates farther and farther from the average is less and less likely to have appropriate provisions made for

him, and has progressively less opportunity to demonstrate his extraordinary ability.

The area in which individual differences can become evident most easily is reading. This is true because in most schools children have some access to library books through which they can demonstrate and develop reading skills, and because in most schools reading tests are given which point out differences. Walton (1961) showed that teachers are most effective in identifying good readers, and are least effective in identifying wide interests, unusual ideas, originality, and imagination, all of which are assumed to be components of creativity.

In order for the individual to reveal special talents or abilities, those abilities must be encouraged and nurtured. It is difficult to conceal lack of ability for a sustained period of time. It is possible, however, to conceal high ability indefinitely if the perceived situation warrants it. Might it be true that, even in a school such as the University Elementary School where effective performance of high quality is prized, children conceal abilities and talents in favor of the group activity? One might ask whether it is ever possible in present day school situations to establish an ideal environment for encouraging excellent individual production. The pressure for group production and group work may serve to preclude opportunities for individual expression more than we know, or care to admit.

5
Discussion and Implications

The present study points out that qualitative excellence in products is related to high intelligence, and presents a somewhat different view of abilities than that conveyed by differences between measures of creative process and of intelligence. The assumption from the present findings is that the person of high ability as measured by tests has also many unmeasured abilities, and that the healthy view toward the individual who is intellectually gifted is that the person has many untapped potentialities. To borrow terms, the view of his potential should be divergent rather than convergent. That is to say, rather than to perceive the gifted young person as one with high potential in a few highly restricted fields, as measured, those working with him more constructively might recognize that they have not tapped many abilities, and then assume that if comprehensive measures could be made, the individual would reveal many added talents. The point at which the dichotomy between measures of creativity and measures of intelligence vanishes is the point at which we make this assumption, and work to develop attitudes and classroom climates to free the potentials of gifted individuals in all fields of learning.

The findings of the present study, however tentative, did not bear out the assumption that ability as measured by intelligence tests is correlated positively with tests of creative process. The only test which related significantly to intelligence was the Association test; no differences were found between high and low IQ groups on four other tests.

The findings on judged products and intelligence differed, however. In five out of eight products, significant relationships were found between high IQ and high quality of each product as judged independently by three experts. Judgments made by independent experts and statistical evaluation of their findings support the belief that giftedness and creativity are not antithetical; and that children who are mentally gifted also possess many of the abilities and attributes which are elements in creativity.

Because tests of intelligence are limited to certain areas, it does not follow necessarily that successful performance by the identified gifted person is also limited to those areas measured. It appears more reason-

able to assume that excellent performance might also be predicted on added measures related to human abilities, at least well beyond chance occurrence; and that, given additional valid measures of abilities, multiple and diverse areas of added talent might be identified in the gifted person.

The terms *academically talented* and *mentally gifted* have not been accorded the scope they should have. Too often references are to the limitations of the IQ test, which is criticized as a means for identifying the gifted child. The critics typically refer to the IQ as a fairly good index of whether a child will obtain good grades in academic areas, and point out that the intelligence test is seriously limited as far as assessment of general intellectual ability is concerned. The assumption has been made that the person who has the high IQ score is somewhat conforming, docile, a grade getter, and does not possess the attributes of creativity (Steinberg, 1962). General intelligence as measured by the intelligence test has been discarded as an outmoded and limited concept (Steinberg, 1962) in favor of the more recent attempts to validate traits of intelligence. The effect of these criticisms from persons of sometimes formidable academic stature has been to limit the regard of many school people for the intelligence test as a valuable instrument and as a tool which identifies a population possessed of remarkable multiple abilities and talents (California State Department of Public Instruction, 1961).

Reference is made to tests of general intelligence as mainly tests of academic aptitude which represent a combination of aptitude for mathematics and aptitude for language. The tests are described as tests of language and math learning—reading and understanding what is read in textbooks and remembering well enough to record it later on (Steinberg, 1962). Perhaps some of the confusion generated through the implied limitations inherent in such statements can be cleared away, and faith restored in whatever valid instruments we possess at present by examination of what is included in these skills.

Communication at any age depends upon the use of symbols, whether spoken, written, or portrayed through gesture. Man's greatest need in learning, and the greatest single objective of education from infancy through adulthood is the acquisition of symbols. The prediction of learning in school, and intelligent planning to nurture learning necessitate the sampling of behavior which can be shown to be related to such symbol acquisition.

The person who has high aptitude for learning language and mathematics started earlier than the average. He has learned more rapidly than others throughout his life, and therefore, at any given age, typically possesses a greater fund of information than others. He has

sampled widely and successfully from accumulated knowledge in various human fields, and presumably has a broader background of learning as a point of departure in his own endeavors.

In the verbal area, one of his measured abilities, we have the basis for production of poetry of any type, of literature, and of research. Verbal or language aptitude is essential and important in the study and resolution of social problems, in learning about the history of mankind, in appreciating one's role in the history of humanity, in becoming a better person, and in living an effective life. Verbal aptitude is important in learning in any vocational field, and in communicating one's ideas effectively to others. In short, the implications of measured verbal abilities extend far beyond the test rating. It is hard to think of many areas where verbal ability is not vital.

The dimensions of mathematics can be extended similarly to vocations, to the various sciences, and even to many aspects of the arts. Mathematics is basic to invention and many creative endeavors.

The group of individuals identified as gifted through tests has within it many persons capable of highly creative performance. Nurture of the abilities of the gifted is our most pressing task, yet the attention actually paid to the exceptional talents of this population has been mostly verbal, even today.

If we look at the way man in modern society has channeled his countless abilities into thousands of occupations, the evident human variations which must be present in those who will be adults in two decades or less should be evident to us. At the child level it is too often difficult to recognize the differences which are so apparent in adults who have relative freedom in their choice of destiny.

The trends in education militate against the gifted. Increasingly crowded schools necessarily mean increasing disregard for the gifted. The current search for mass efficiency via team teaching of large groups and the auditorium approach limit the meaningful experiences available to the gifted. The lack of public concern for appropriate educational opportunities for the gifted handicaps school personnel in making effective provisions.

The tendency on the part of some to regard intellectual giftedness as a circumscribed and limited sphere and to convey the impression that intelligence tests are no longer useful or modern has created some problems. Those who are hostile toward the gifted find ammunition in the pronouncements about the mere IQ. Instead of meeting the obligation of providing appropriately for the gifted, the doubters conserve their energies for the day when we know more about creativity.

The search for talents as something apart from intellectual giftedness may contribute to knowledge in the sense that it tends to sharpen

our awareness of individual differences and abilities. It becomes a disservice when it assumes the exclusion of abilities within groups. In this sense it really becomes a kind of inverse snobbery. The frequently heard statement that all persons are creative is somewhat akin to the assertion that all children have gifts. Truisms of this nature are comforting to the mass of us, for nothing is less comfortable than the admission that another person has more ability and talent than we possess. Yet the statements serve mostly to dull our sensitivity to differences and lessen our concern for providing a meaningful educational environment for the exceptionally gifted individual.

Some teachers talk about the gifted as not really being gifted. They question the reports of test results and the reports of research on the characteristics of the gifted. The skepticism is based upon the comment, "They don't really show these characteristics." The skeptics overlook the results of the characteristics themselves. The ability of the gifted to assess a situation and adapt to it, their sensitivity to others and to group pressures, mean that they can easily assume any of a number of roles within the classroom. If abilities are not encouraged, they can remain buried.

It is the view of the writers that the greater the giftedness in the school situation, the greater the pressure on the individual to conform. In this sense, creativity is most susceptible to thwarting in those who are potentially most productive. Learning to guard against limiting children who want to learn is difficult even for the best teachers. Comments like "You shouldn't read so much" communicate to the young child the values of adults who are important to him. The comments may be made to the child who derives much delight from reading, and who also does many other things well. It is likewise difficult for the child to understand the remark of the adult when he says, "You ought to wait until next year."

The problem of fostering creativity, or talent, or giftedness, has been with us for a long time. Certain semantic changes have occurred, but the matter of whether one feels comfortable reading about the problem-solving process in the writings of John Dewey or in the writings of later authors on the creative process who adopted Dewey's pattern and changed the terms is not important. What is important is that persons who are truly interested in the development of the abilities of the gifted and talented employ some of the wisdom which has been available to school personnel for decades.

We have known for a long time that teachers who support the interests of children and regard them as valid and legitimate are rewarded by continuation and extension of interests. Teachers who permit children to search for information, to explore ideas, who employ skillful

questioning to spur curiosity are those who facilitate the development of interesting and unusual products. Such teachers respect the right of the child to use his imagination because they are basically individuals who respect others.

The respect for others is not a quality which exists only in one's relationships to persons of comparable age. True respect for others probably is inherent in the personality of the individual and is found in the person who is somewhat opposite to the structured teacher who prides himself on his closely planned classroom organization.

The teacher who is successful with the gifted and who tends to encourage their creativity is the one who can accept novel ideas without negative reaction, and, if necessary, can use questions to help children clarify or even change ideas. The willingness to be flexible about classroom procedures, to be tolerant of difference whether in ideas or products, is vital to the development of an environment which develops creativity.

The teacher who encourages creativity in children places ideas before perfection in importance. The primary emphasis is on the expression of thoughts and feelings, and upon effective communication rather than upon perfect spelling, or upon one style in composition. The teacher who accords mechanics second place rather than first place in importance can help the children learn techniques without stifling them in the process. And this teacher will not be baffled by the bright children who keep their expression to a minimum so that they will have less to correct!

It is helpful for the gifted to learn certain skills which will free them for added exploration and discovery. Development of facility in the use of language and in the use of symbols is important. Opportunities for learning about writing can emanate from the works of the children themselves, but the amount of detailed perfection required must be kept within realistic bounds so that the interest in writing is not killed in the zeal for accuracy. Assistance with compositions done for legitimate purposes over a period of time will develop written communications skills.

Along with skills in the use of symbols, the child can be freed to learn through the acquisition of library skills. The library probably will be his most important source of knowledge, and much of the learning will be relatively independent of direct assignments. The child who learns where to seek information in order to check his hypothesis or to test a new idea needs to have access to the storehouse of human knowledge.

The teaching of skills and techniques is important in areas other than those indicated. Children need assistance in certain techniques and need a fund of information in the arts as they do in other fields.

If the teaching centers upon technique, and if technique assumes major importance, the result is the same as in composition. The products or performance of the children develop a certain similarity, and the potential charm to be found in unique differences is not forthcoming. Again, the focus must be placed upon the expression, and techniques should be taught in sufficient variation so that the child does not assume a constricted pattern of expression in his desire for adult approval.

Part of the answer may lie in the teacher's direct encouragement of variety in response. In listening to music, for example, the children may learn to identify changes in mood, tempo, and rhythm. They may even consider individually ways to express the music they hear. The allowance for and encouragement of individual expression and interpretation in rhythms will forestall the follow the leader approach where all of the children automatically become galloping horses when a given recording is used.

The teacher who values initiative and inquiry on the part of the child will avoid initial detailed structuring of assignments. The allowance of a margin of freedom will provide opportunity for the child to use his own methods, resources, and ideas in a given situation. In the process of working out his own solutions to problems the child may create or invent products and ideas of lasting worth.

Flexibility of structure should extend beyond assignments to include procedures. Insisting on the committee approach in activities for the sake of democracy can kill individual uniqueness. The necessary compromise of ideas inherent in the committee approach can be limiting in the sense that the highly gifted individual could easily develop a kind of intellectual indolence. Individual work even for the very young school child is often legitimate, and it is possible that the child may pursue individual interests beyond all adult expectations with intense zeal.

It is helpful to remember that by definition anything creative is new, original, and therefore different. Different works and ideas and productive controversy therefore must be legitimate in the classroom. The right of the children to produce differently must be respected. Allowance for difference is difficult and sometimes uncomfortable, but the assumption should be that the child has the right to be himself and to function at his best.

Teachers are often hesitant about looking at child products and judging them creative, or about labeling products original, or talking about the effectiveness of ideas expressed by an individual. They feel that they do not have the needed expertness to so judge. It is true that few of us would qualify as experts on the basis of our own contribu-

tions to the lasting aesthetic works of mankind, even if we exhumed some of those we carefully conceal. Nevertheless, the teacher of any class can sensitize herself to the possibilities for encouraging individual differences in production, and be alert to means for helping the child develop any manifest abilities he has.

Teachers would not utilize the rating scales of the present study formally to identify outstanding productions. Rather, awareness of such criteria for judgment and informal attention to outstanding works by children should tend to increase sensitivity and appreciation in the teacher, who may then increase opportunities for the children to use their special, individual talents and interests.

Beyond the check lists, teachers can be alert to the occasional work of a child which needs no words to describe its worth. These works should be treasured in expressions of appreciation to the creators, sometimes on a person to person basis. Few things encourage continued productivity as much as the praise of an admired adult.

Finally, the teacher who communicates to children her own deep, abiding love for lasting ideas, beautiful expressions in poetry and prose, and the finest in art and music will attune them to the best of man's works in all realms of creativity and encourage them to participate creatively in many ways.

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Appendix, The Judges

The consultants who were selected to evaluate the children's products had two characteristics in common: they were all experts in the particular field for which they served as judges, and they were all persons of wide experience in elementary education. The following brief descriptions of their backgrounds establish their qualifications.

Art

Frances Hine. Dr. Hine is consultant in elementary education art for the Los Angeles County Superintendent of Schools Office. In this assignment she acts as a consultant in art to teachers of the school children in a county system presently more populous than most states. Dr. Hine holds the master of arts degree from the University of California at Los Angeles and a doctoral degree from the University of Maryland. She is well known for her work in the Pacific Arts Association, the California Association for Supervision and Curriculum Development, and for her writings in *Educational Leadership, Childhood Education,* and other journals.

Elizabeth Morris. Mrs. Morris has taken graduate work at the Claremont Graduate School, the University of California at Los Angeles, the University of California at Berkeley, the Chouinard School of Art, and has taken special study in painting with Rex Brandt. She is art consultant for the Montebello Unified School District, one of the larger districts in Los Angeles County. Mrs. Morris has been an active member and officer of the Southern California Art Education Association and the Pacific Arts Association. She has contributed articles to art journals and has written guides for use in the Pasadena and Montebello school systems. She has taught art education classes in a number of Southern California colleges.

Josephine Schultz. Dr. Schultz is professor of art at the California State College at Long Beach. She has served as an art teacher in elementary schools, supervisor of art in a demonstration school, as a supervisor in public school systems, and as a consultant in art education at the state level. She has taken graduate work at the University of Washing-

ton, the University of Oregon, the Art Students League in New York City, and Teachers College, Columbia University. She is the editor of *Planning Facilities for Art Instruction*, and is on the editorial board of *School Arts*.

Social Studies

Jeanne Delp. Miss Delp is consultant for the gifted in the Garden Grove Unified School District. She has served as a curriculum consultant on the California Study of Programs for Gifted Pupils and has taught extension courses on the gifted for the University of California at Los Angeles. Miss Delp has served as consultant on the gifted to a number of school systems throughout California and has taught a summer demonstration class at the University of Nebraska. She holds the bachelor of arts degree from Stanford University, and the master of arts degree from Sacramento State College.

Eleanor Manning. Mrs. Manning is curriculum consultant for the East Whittier city schools. Her masters degree is from Whittier College. Her particular assignment in curriculum for her school system is consultant for the program for academically capable students. As the district consultant she has been instrumental in planning demonstration facilities and special courses for inservice teacher education.

Marguerite Swafford. Mrs. Swafford is reading consultant in the West Covina Unified School District. She holds the master of arts degree from Los Angeles State College. Her teaching experience ranges from preschool through adult education and includes teaching literacy classes for soldiers in the US Army of Occupation in Japan. She holds elementary, secondary, and school administration credentials.

Creative Writing

Grace Garretson. Mrs. Garretson, recently retired from the Whittier City school system, served for many years as a classroom teacher, consultant in music, library consultant, and general curriculum consultant. She developed a reputation as an outstanding teacher in the field of creative writing, and devoted much of her time as a consultant to working with teachers in the development of creative writing skills in children.

June Oxstein. Mrs. Oxstein is assistant professor, School of Education, California State College at Los Angeles. She has taught at the elemen-

tary level in California and in the Air Force Dependents School in central France. Mrs. Oxstein has held positions as assistant principal, and curriculum consultant in elementary school systems of Los Angeles County. She was a fellow at Claremont Graduate School in 1961, where she is currently completing requirements for the Ph.D.

Dorothy Syphers. Mrs. Syphers is curriculum assistant, Arcadia Unified School District where she has been coordinator of the program for gifted pupils since 1956. She has given demonstrations and lectures on creative writing in various school systems and has served as a demonstration teacher in creative writing for gifted children. In the spring of 1963, she served as consultant to the State Department of Education in North Dakota.

Music

Muriel Dawley. Miss Dawley is consultant in elementary education music for the Los Angeles County Superintendent of Schools Office. She is coauthor of *Sing and Play with the Autoharp, Sing and Play with the Bells, North American Indian Songs* and other works. Miss Dawley was one of the writers of the *Teachers Guide to Music in the Elementary School,* adopted as a teachers' manual by the California State Board of Education. She has a master of arts degree from the University of Southern California. At the present time she is consultant to the Follett Publishing Company in the development of a music series for the elementary grades.

Genieve Fox. Mrs. Fox has studied piano with Sophia Santz of the Sorbonne and William Happich. She was a member of the Isadora Duncan dance group and is now working in dance therapy with Mary Whitehouse and Trudy Schoop. She has taught in most of the elementary grades and is a kindergarten specialist. She has evaluated recordings for children and experimented with James Mursell on the use of ethnic music with young children. Her present responsibility is selection of materials for the Children's Music Center in Los Angeles.

Helen Whitaker. Mrs. Whitaker has served as a classroom teacher, a consultant in music, and as a faculty member of the California State College at Los Angeles. She recently served as Assistant Professor of Music at the California State College at Long Beach. Mrs. Whitaker is a graduate of the University of South Dakota, received the master of arts degree from the University of Southern California, and has studied piano in Europe and at the Chicago Musical College. She is the author of *Sing and Celebrate,* a book of original songs for young children.

Arthur Costa. Mr. Costa has served as education consultant for the National Aeronautics and Space Administration. His background includes elementary teaching and consultant in elementary education science for the Los Angeles County Superintendent of Schools Office. Mr. Costa is the author of articles in *Science Education* and has produced educational materials in his capacity as NASA science consultant. He currently is director of elementary education for the Sacramento County Superintendent of Schools Office.

William Porter. Mr. Porter is an honors graduate of California State College at Los Angeles, where he majored in elementary education. He has taught in Los Angeles and Beverly Hills, including extended day science to gifted students, for several years. He has taught natural science for the Wilshire Temple summer camp during the past eight summers. He has served as one of the regional vice presidents of the Elementary Schools Science Association and holds a masters degree from San Fernando Valley State College.

Ben Strasser. Mr. Strasser is consultant in elementary education science for the Los Angeles County Superintendent of Schools Office. He received his master of arts degree at San Fernando Valley State College and is a doctoral candidate at the University of California at Los Angeles. In the Los Angeles City Schools he has served as a reserve teacher in mathematics and science. Mr. Strasser has written articles for *Childhood Education,* is the author of an elementary science book, and has produced two elementary science films.